APPENDIX F

LONG BEACH SPORTS PARK MULTIPLE FIELD LIGHTING PROJECT, PRELIMINARY INFORMATION PACKAGE



Presented to:

Long Beach Sports Park Multiple Fields Lighting Project Long Beach, California March 1, 2004

Submitted by:

Musco Lighting, LLC

15311 Barranca Parkway Irvine, California 92618

Local Phone: 949/754-0503 Toll Free: 800/659-0117 Fax: 949/754-0637

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Musco Sports Lighting, LLC West Region

Phone: 949/754-0503 800/659-0117 toll free

Fax: 949/754-0637

15311 Barranca Pkwy

Irvine, CA 92618 www.musco.com

Date:

March 1, 2004

To:

LSA Associates

20 Executive Park

Suite 20

Irvine, CA 92614

From:

3.

Mr. Michael Marchetti

Orange & San Diego Counties Representative

Lighting criteria presented in this prototype proposal are computer-generated from projects similar to yours, based on the following assumption:

1. Size of your fields - Softball Fields:

Varying sizes all with 60' basepaths

Skate Park:

120' x 150'

Volleyball Courts:

60' x 30', 10' between sidelines

Soccer Fields:

330' x 210'

Driving Range:

440' x 210'

Level of play -2.

Light levels -

Recreation

Softball Fields:

50 footcandles maintained infield

30 footcandles maintained outfield

Skate Park:

30 footcandles maintained

Volleyball Courts:

50 footcandles maintained

Soccer Fields:

30 footcandles maintained

Driving Range:

19 footcandles maintained

D. Range @ 200 yards: 5 footcandles maintained at 15'

4. 2000 PSF soil (the nationwide average)

This package is provided to assist you during preliminary planning and to introduce the capabilities of Musco's products and services.

Final criteria for the project will be formulated on a detailed analysis of your facility. As the project develops and exact standards are defined, I will be able to provide you with a projectspecific design, which may differ in several aspects from this prototype.

Once customized specifications have been developed, Ms. Pat Guertin in our Customer Service Department will ensure that equipment is manufactured in accordance with project criteria and that delivery is timely.

Throughout the project, we will be available to answer questions and to work with you in developing a final result that meets your requirements and budget.





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Drawing #105273sodr1 dated 18-Feb-2004

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Preliminary Specification: LIGHT-STRUCTURE SYSTEM

DRAFT – For discussion purposes ONLY

The following criteria are to be met by the product proposed to be provided for lighting the multiple fields for Long Beach Sports Park.

1. STRUCTURAL STEEL

- a. PRESSURES applied against all structural components shall be determined based upon 70 m.p.h. winds as defined by CBC-C criteria.
- b. **STRENGTH** of the materials used in the structures shall be calculated based upon AASHTO Pole Structure Criteria.
- c. **FOUNDATION** design criteria are to be based upon BROMS Standards using a safety factor of 3. (Alternate UBC.)
- d. **FINISH SHALL BE GALVANIZED** by hot-dipping processing to ASTM A-123 standards shall be used for pole, crossarms, braces, hubs, or any extensions attached to the pole.

2. CONCRETE BASE

- a. **BASE** is to be formed with concrete that obtains 9500 PSI strength and contains pre-stressed steel cable that is stressed to 28,910 lbs. (which shall be 70% of the ultimate yield strength of the cable).
- b. **BACKFILL** around the embedded base shall be achieved with concrete to assure the foundation design criteria.

3. ALUMINUM COMPONENTS

ALUMINUM materials shall be powder coat painted or anodized to MIL-A-8625E and coated with a clear thermoset polymer.

4. STAINLESS STEEL DEVICES

STAINLESS STEEL materials shall be used for all fasteners, latches, hinges, and threaded devices. All stainless steel shall be coated with clear thermoset polymer coated.

5. ELECTRICAL CIRCUITS

BRANCH CIRCUITS for each lighting structure shall be provided that include the following:

a. **DISCONNECT** - Circuit disconnect type.

- b. **LANDING LUGS** for the feeder circuit as part of the disconnecting device.
- c. **FUSE BLOCK** for individual fusing for each load carrying conductor of each lamp circuit. (Neutral conductors are not fused.)
- d. PLUG IN OR LANDING PLUG CONNECTIONS Manufacturer shall provide all branch circuits completed from the disconnecting device to the lamp with either plug-in or landing lug connections provided for completion of circuits during the field installation. This is to assure that the electrical equipment on the pole is in conformance with U.L. standards.
- e. WIRE HARNESS shall be provided with:
 - (1) UNIFORMLY WOUND conductors to avoid excessive stress on any individual conductors.
 - (2) **MYLAR WRAPPED** wire harness to prevent unraveling of the conductors.
 - (3) WIRE SUPPORT GRIPS attached and TIED for mounting the wires inside the pole.
 - (4) ABRASION PROTECTION SLEEVING shall completely encase the wire harness to alleviate wear on the insulation of the conductors caused by abrading the interior of the pole.
 - (5) PLUG-IN CONNECTIONS for each end of the wire harness to connect it to the electrical component enclosure near the base of the pole and to the lamps at the top of the pole to assure proper matching of circuits.
- f. ASSEMBLY and wiring of the fixtures to a plug-in connection is to be completed by the manufacturer who is to provide a warranty of the entire assembly. Manufacturer shall provide a schematic of the wiring on the inside of the door of the electrical component enclosure.
- g. GROUNDING of the electrical system and the equipment shall be provided throughout the pole structure for connection to ground rods and feeder circuit ground wires.
- h. **MOUNTING** of the NEMA 3R enclosure containing all electrical components, except the lamps, shall be near the base of the pole with the bottom of the enclosure 10 feet above the ground to allow for step ladder maintenance access.
- (UNDERWRITER LABORATORIES) LISTING REPORT shall be provided for the entire Light-Structure and its included electrical system in addition to the use of U.L. listed components within the system.

6. PHOTOMETRIC UNIT

- a. **STRUCTURES** for the luminaire assembly on each pole are to be completely assembled in the factory and aimed to form one single photometric unit with the alignment and performance to be guaranteed by the manufacturer.
- b. RECAPTURE OF THE AIMING after movement of the fixture during installation or relamping shall be achieved by a positive latching device. In addition there shall be stainless steel bolt and nut to secure the alignment.

7. LIGHT CONTROL

- a. **ENERGY EFFICIENT LUMINAIRES** which control light energy and resulting electrical energy use must be such that the reflector system design places more than 60% of the total light output in the lower portion of the projected light below the maximum candlepower point and thereby onto the field to be illuminated.
- b. **SPILL** light onto adjoining areas and into sky glow must also be restricted and shall meet the same criteria that more than 60% of the total light is in the lower portion of the projected light below the maximum candlepower.
- c. GLARE light as viewed from off-site locations shall also be controlled with a reflector system that projects more than 60% of the total light into the lower portion of the projected light below the maximum candlepower.

8. LIGHT LEVELS

GUARANTEED footcandles of light as measured by a light meter on a horizontal plane shall be provided as follows:

a. **INITIAL** light levels are to average:

FIELD	INFIELD	OUTFIELD	
Fenway Park – Field 1	62.50 footcandles	37.50 footcandles	
Yankee Stadium – Field 2	62.50 footcandles	37.50 footcandles	
Tiger Stadium – Field 3	62.50 footcandles	37.50 footcandles	
Ebbett's Field – Field 4	62.50 footcandles	37.50 footcandles	
Crosley Field – Field 5	62.50 footcandles	37.50 footcandles	
Wrigley Field – Field 6	62.50 footcandles	37.50 footcandles	

FIELD	ENTIRE FIELD	
Skate Park	37.50 footcandles	
Each Volleyball Court	62.50 footcandles	
Each Soccer Field	37.50 footcandles	
Driving Range	23.75 footcandles	
Driving Range @ 200 yards	6.25 footcandles at 15'	

These initial light levels are designed to provide **MAINTAINED** footcandles of 80% of the initial and would produce an average of:

FIELD	INFIELD	OUTFIELD	
Fenway Park – Field 1	50 footcandles	30 footcandles	
Yankee Stadium – Field 2	50 footcandles	30 footcandles	
Tiger Stadium – Field 3	50 footcandles	30 footcandles	
Ebbett's Field – Field 4	50 footcandles	30 footcandles	
Crosley Field – Field 5	50 footcandles	30 footcandles	
Wrigley Field – Field 6	50 footcandles	30 footcandles	

FIELD	ENTIRE FIELD	
Skate Park	30 footcandles	
Each Volleyball Court	50 footcandles	
Each Soccer Field	30 footcandles	
Driving Range	19 footcandles	
Driving Range @ 200 yards	5 footcandles at 15'	

b. **UNIFORMITY** of the brightest to darkest measurements of horizontal footcandles shall be:

FIELD	INFIELD	OUTFIELD
Fenway Park – Field 1	2.0:1	2.5:1
Yankee Stadium – Field 2	2.0:1	2.5:1
Tiger Stadium – Field 3	2.0:1	2.5:1
Ebbett's Field – Field 4	1.5:1	2.5:1
Crosley Field – Field 5	2.0:1	2.5:1
Wrigley Field – Field 6	2.0:1	2.5:1

FIELD	ENTIRE FIELD	
Skate Park	2.5:1	
Each Volleyball Court	2.0:1	
Each Soccer Field	2.0:1	
Driving Range	3.0:1	
Driving Range @ 200 yards	11.0:1	

c. SPILL light surrounding the playing field shall be measured during the initial hours of operation and the manufacturer shall guarantee that there will be less than the below listed footcandles of light generated at the number and location of point around the playing facility shown on the drawings. The spill light at these defined locations shall be measured by pointing a light meter at the brightest light source visible from the designated location.

FIELD	MAXIMUM	AVERAGE	
All Fields Together	.56	.25	

9. WARRANTY - 7 Year

- a. Manufacturer shall warrant in writing the entire structure (excluding fuses and lamps) to be free from defects in materials and workmanship for a period of seven years starting from the date of delivery.
- b. Manufacturer agrees in writing to provide labor and materials for a period of two years to replace defective parts or repair defects in workmanship, or, at its election, to pay reasonable costs of labor for such repairs. For the remainder of the warranty period, replacement materials will be provided at no charge.
- c. Lamps shall be warranted by the manufacturer in writing not to fail for two years from the date of delivery. Lamps which fail during the first year of the warranty period will be replaced and installed at no cost to the owner. Lamps which fail during the second 12 months will be replaced by the manufacturer but installation will be the owner's responsibility.
- d. Manufacturer warrants in writing accurate alignment of the luminaires on the luminaire assembly for a period of seven years starting from the date of delivery

10. PATENT RIGHTS AND INFRINGEMENT

There are various established performance criteria throughout this request for products and services. There may exist patent coverage for some means and methods of achieving those performance criteria. Bidders are responsible for ascertaining that means and methods of the products and services which they are providing are not being provided in violation of any such patent rights. Bidders responsibilities are as follows:

- a. To hold harmless, the owner, as to any violation to include dollar amounts that could be owing as a result of damages for infringement including potential treble damages as provided for under U.S. Patent Law.
- b. Any and all costs that the owner would incur in replacing materials and services which are determined to infringe patent rights.
- c. All administrative, legal and other costs that would be incurred as a result of an infringement.

If any product or services proposed to be provided by the bidder are known by the bidder to be subject to any existing claims of infringement, bidder shall notify owner of such claim and provide evidence of financial ability to perform on the above hold harmless requirements.

11. **DOCUMENTATION**

COMPLIANCE with the criteria set out in this specification shall be demonstrated by the following documentation to be provided at least 10 days prior to bid as a condition for approval to bid:

- a. **INITIAL HORIZONTAL LIGHT LEVELS** at the number and location of points shown on the drawings.
- b. **MAINTAINED HORIZONTAL LIGHT LEVELS** at the number and location of points shown on the drawings.
- c. **COMPUTER GENERATED SPILL/GLARE ANALYSIS** at the number and location of points shown on the drawings.
- d. POLE CALCULATIONS certified by a licensed structural engineer.
- e. **FOUNDATION DESIGN** with soils assumptions.
- f. U.L. CONFIRMATION LETTER for the Light-Structure, including the equipment and electrical system for the pole, crossarms, and fixtures.
- g. WARRANTY by manufacturer.
- h. **STRUCTURAL DRAWINGS** for the luminaire assembly with licensed structural engineer's certificate to verify that the fixtures and support will withstand 125 m.p.h. wind with 1.3 gust factor without damage or misalignment.
- i. PHOTOMETRIC REPORT by Independent Testing Laboratories showing that 60% of light energy is projected below maximum candlepower point.
- j. BRANCH ELECTRICAL circuit and drawings.
- k. CORROSION PROTECTION certification by the manufacturer that all latches, fasteners, hinges, and threaded devices, excluding those being used for electrical connections, for the pole and luminaire assembly are of stainless steel construction; that all aluminum is anodized; and that all steel not required to be stainless steel is hot-dip galvanized to ASTM A-123 standards.

How to read Musco light level scans:

On the right hand side of the scan there is a box beneath the Musco logo, within this box is a summary of the light level information on the scans.

The first line in the box describes which scan you are viewing; there are four possible options. *Initial Illumination* and *Maintained Illumination* depict light levels on the playing field; *Initial Spill Light Maximum* and *Initial Spill Light Horizontal* depict offsite or 'spill' light levels. All levels are given in footcandles, below is a description of the four possible scans:

- INITIAL ILLUMINATION = The initial footcandle level for the field on the scan. These are the footcandle values you can expect to achieve the first time you turn the lights on for approximately the first 100 hour of operation of the lighting system.
- MAINTAINED ILLUMINATION = The maintained footcandle level for the field on the scan. These are the footcandle values you can expect to achieve for the useful life of the lamp (approximately 3,000 hours for a 1500 watt metal halide lamp), after the 'initial' burn-in of the lamps (first 100 hours). Please Note all footcandle values decrease by approximately 20%, this is a natural characteristic of the metal halide lamp.
- INITIAL SPILL LIGHT, MAXIMUM FOOTCANDLES = These scans depict the initial spill light (0-100 hours of operation) along a given spill line. The MAXIMUM value means the light meter is pointed directly towards the brightest light source at the facility (this measurement can be loosely defined as 'glare').
- INITIAL SPILL LIGHT, HORZONTAL FOOTCANDLES = These scans depict the initial spill light (0-100 hours of operation) along a given spill line. The HORIZONTAL value means the light meter is placed on the horizontal plane (parallel with the ground, light sensor pointing up) and measures the quantity of light striking that horizontal surface (this measurement can be loosely defined as 'spill'). Typically, 'horizontal' reading will be significantly lower than the 'maximum' values.
- Please note all 'spill scans' are run in the initial only. This means the footcandle values on these scan will drop by 20% after approximately 100 hours. We run them in the initial so everything is a worst case scenario on the spill scans.

The next line in the box says 'Horizontal footcandles on plane at z = 3' this simply means all light levels are calculated at 3' above the ground. Below this line are a series of numbers, which are a summary of the scan itself. The 'important' ones are as follows:

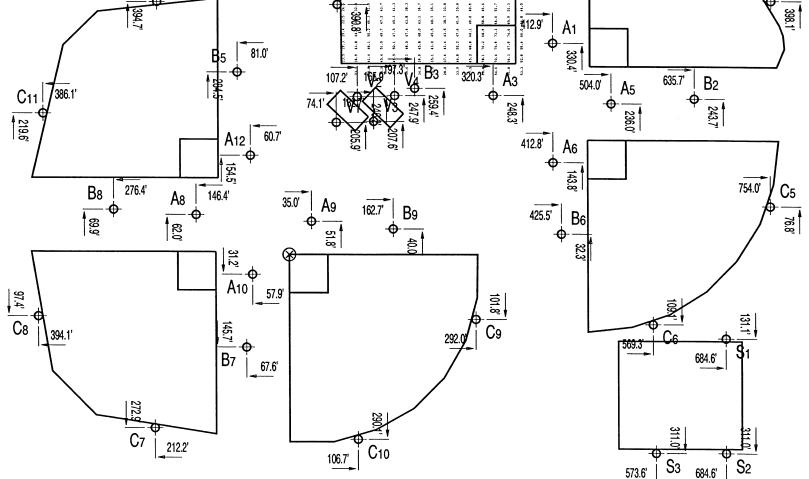
- Target Points = How many different locations were used to calculate the light levels.
- Average = Average footcandle level on that scan.

- Maximum = The largest footcandle value on that scan.
- Minimum = The lowest footcandle value on that scan.
- Max/Min = This is the uniformity ratio and compairs the highest and lowest footcandle reading on the scan, it is a way to measure the smoothness of light.

Below those number is a line for 'Number of Luminaires' which tells you how many lights we are using to light the area on the scan, and then there is the 'KW Consumption' which shows what your kilowatt consumption will be per hour with all Musco lights turned on.

The other important information on the scan is located in the upper left hand corner in box titled 'Equipment Listing'. In this box you will find the pole identification, the height of the pole, the number of fixtures on each pole, and kilowatt consumption for each pole per hour.

LONG BE				i	ΓING	LIS	PMENT	EQUI	
			Kilow /unit	Fixt. /unit	Elev.	Pole size	Mounting height	Pole location	Pole count
			12.8	8	0'	60'	60'	A1	1
			6.4	4	0'	60'	60'	A3	1
			12.8	8	0'	60'	60'	A5	1
			6.4	4	0'	60'	60'	A6	1
			12.8	8	0'	60'	60'	A8	1
			6.4	4	0'	60'	60'	A9	1
			12.8	8	0'	60'	60'	A10	1
			6.4	4	0'	60'	60'	A12	1
			32	20	0'	80'	80'	B1-B2	2
252.5 C _A			16	10	0'	80'	80'	B3-B6	3
252.5' C ₄			33.6	21	0'	80'	80'	B7	1
			32	20	0'	80'	80'	B8	1
			17.6	11	0'	80'	80'	B9	1
			12.8	8	0'	70'	70'	C1-C5	5
			17.6	11	0'	70'	70'	C6	1
A R R R R R R R R R R R R R R R R R R R			12.8	8	0'	70'	70'	C7-C12	6
			6.4	4	0'	50'	50'	S1-S3	3
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Fixture Type: Lamp Type: Lumens:

Prepared By:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

Lumens: 155000 File # / Date: 105273v

105273wwc / 18-Feb-2004 MBELLOMA



	INITIAL ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3
	BASEBALL
1	HORIZONTAL FOOTCANDLES
	ON PLANE AT Z= 3

	<u>Infield</u>	Outfield
Target Points:	25	181
Average:	63.09	37.88
Maximum:	78.15	52.17
Minimum:	47.50	21.03
Avg/Min:	1.328	1.801
Max/Min:	1.645	2.481
UG (Adj pts)	1.373	1.636
CV:	0.141	0.205

Number of Luminaires: 44 * KW Consumption: 462.40

**Average Tilt Factor: 0.971
***Recoverable Light Loss Factors: x 1.000

***Recoverable Light Loss Factors: x <u>1.000</u> Total Light Loss Factor(LLF) 0.971

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



4	6.4			
8	12.8			
4	6.4			
8	12.8			
4	6.4			
8	12.8			
4	6.4			
20	32			
10	16		>	
21	33.6		252.5' C ₄	77.1' C1
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	1	1.54.5;	43.8	754.0 V_{C_5}
		B8 2/6.4' A8 146.4' 35.0'	A	^{754.0′}
			A9 162.7' B9 425.5' B6	/P
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TLC MZ/TLC MZ Fixture Type: Lamp Type: 1500W MZ/1500W MZ 155000 Lumens: File # / Date:

105273wwc / 18-Feb-2004 MBELLOMA

Prepared By:



MAINTAINED ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

	Infield	<u>Outfield</u>
Target Points:	25	181
Average:	50.47	30.30
Maximum:	62.52	41.74
Minimum:	38.00	16.82
Avg/Min:	1.328	1.801
Max/Min:	1.645	2.481
UG (Adj pts)	1.373	1.636
CV:	0.141	0.205

Number of Luminaires: 'KW Consumption: 462.40

**Average Tilt Factor:

0.971 ***Recoverable Light Loss Factors: x <u>0.800</u> Total Light Loss Factor(LLF) 0.777

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING

height

60'

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

80'

70'

70'

70'

50'

50'

count

1

1

2

3

1

1

1

5

6

3

4

location

A1

A3

A5

A6

A8

A9 A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

Mounting Pole

Pole Fixt. Kilow size Elev. /unit /unit

60' 0' 8 12.8

60' 0'

60' 0'

60' 0'

60' 0'

60' 0'

60' 0'

80' 0'

80' 0'

80' 0'

80' 0'

80' 0'

70' 0'

70' 0'

70'

50' 0'

50' 0'

0'

0,

60'

_	size	Elev.											
	60'	0'	8	12.8									
	60'	0'	4	6.4									
	60'	0'	8	12.8									
	60'	0'	4	6.4									
	60'	0'	8	12.8									
	60'	0'	4	6.4									
	60'	0'	8	12.8									
	60'	0'	4	6.4									
	80'	0'	20	32									
	80'	0'	10	16				252.5'	C4		577.1' C	۸.	
	80'	0'	21	33.6				202.0	V4	_	577.1' \ C	1	
	80'	0'	20	32					1		3.7 2.5 3.3	<u>×~</u>	
	80'	0'	11	17.6					588.4	28.2 41.3	17.0 49.6 49.0 33.1 30.1 29 0 26.5 90.7 50.0 44.1 40.3 42	36	
	70'	0'	8	12.8						32.5 41.5 4	55.7 48.3 47.1 47.6 46.6 46.4	8 42.3 35.3 24.0	
	70'	0'	11	17.6						38.0 43.5 4	45.9 44.4 44.4 43.7 41.4 41.4	0 1912 3510 3010 225	
	70'	0'	8	12.8						422.6' B1	42.8 42.5 40.3 38.0 35.7 35.8	6 33.4 33.7 32.7 27.6	
	50'	0'	4	6.4			ſ			ф- 36.0	si.4 40.3 38.0 34.8 32.1 32.1	0 30.4 32.0 53.6 54.4 29.5	
	50'	0'	2	3.2	C ₁₂ 207	- g:	76.1' C3			453.1	10.3 39.9 36.1 31.6 29.5 26.	7547	0-
					C12 \ \ 201		^{76.1} ′ C3			30.9 57.5	97.7 37.8 33.0 24.2 27.3 28.7 34.6 37.0 32.8 28.7 28.9 27.3	0 30.3 34.6 41.3 48.3 50.3 36.6 27	C ₂
					+ ω Φ		A			39.3 46.4 4	47.2 42.4 37.8 32.5 28.7 28.	9 32.9 38.5 45.3 50.6 51.9 41.2 30.3	4 يي
					394.7'		390.8'			412.9' A1 53.4 52.5 6	51:9 53:7 44:5 17:0 31:9 31:	9 35.6 40.4 46.1 50.4 50.7 47.# 35.3 27.	\ <u>\</u>
							ا سي			65.9 73.2 6	97.3 50.8 41.6 42.1 35.8 34.º	7 37.7 42.9 46.9 48.3 48.3 49.7 47.1 35.0	·) -
					/	B ₅ 81.0'				ِ اللهِ لا ي	59.6 64.3 59.2 47.4 39.0 35.0	8 37.3 41.9 46.7 46.8 45.8 47.6 46.4 34.4)
					1	1 6		65.9 ^{197.3} V ₄ B3	000.01		55.9 64.3 52.6 38.3 30.4 26.0	6 30.5 \$1.2 38.7 40.8 36.7 30.2 22.7	7
				_	1 -1	284.5	107.2' 1		^{320.3'} A ₃	90.3 (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	A5 638	5.7 ³ B ₂	
				C11	7 386.1'	∫ 3 1⁄2	74.1'	265 E3	Φ-			A	
					d/		14.1	247.9	248.3')		¥ ₂₃ †	243.7	
				219.6	1	A ₁₂ 60.7	Φ	Y- Y- 1			236.0	71	
				၂တ	/ [A12 00.7	205.9	207.6		412.8' A6			7
				/		φ				— ——			
				L		A12 60.7'				143.8			
					B8 276.4' As	3 146.4' 35				نمق		754.0'	C5
						35	.0' A9 10	62.7' B9		425.5' B6		∌	
						Ψ		— Тра		^{425.5} B6			76.8'
					69.9		51.8	40.0		•			سي ا
				Г		——— ≌) 	0.0		ည္က ယ္			
				- 1		A10 57.9'				T			
				1		A ₁₀			1				
				97.4. C8		A10 57.9'			$\frac{1}{2.0} \frac{\frac{1}{2.0}}{\frac{1}{2.0}}$		1	s /	
			Ā	-	}				₩ <u>~</u>		يخريد	₹	
				C ₈ i	394.1'	 		00	~ 1 C9	L			
					100.1	 		28	2.0		569.3	• • • •	
					1	B7 676'						684.6' 31	
						D7 67.6'						- '	
					272.5								
					T	_		290,					
					C7 212	,						311 0	
					G7 _{212.}	4	106.7	C10					
											_{573.6'} S	3 _{684.6'} S2	

Fixture Type: Lamp Type: Lumens: File # / Date:

Prepared By:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273wwc / 18-Feb-2004 **MBELLOMA**

GUARANTEED PERFORMANCE

INITIAL ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z=3

Number of Luminaires: 462.40 KW Consumption:

**Average Tilt Factor: 0.971
***Recoverable Light Loss Factors: x 1.000 Total Light Loss Factor(LLF) 0.971

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

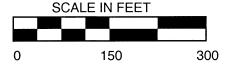
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 $- \Phi =$ Pole Location



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

70'

70'

50'

Mounting Pole

height size Elev. /unit /unit

50' 50' 0' 2

Pole

count

1

1

1

1

1

1

1

2

3

1

1

5

6

3

4

Pole

location

A1

А3

A5

A6

A8

A9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

Fixt. Kilow

^{*}Refer to amperage draw for electrical sizing.

^{**} Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

12.8 6.4 12.8 6.4 12.8 6.4 12.8 6.4			
32 16	252.5 C	4	577.1 C1
33.6	•		35.0
17.6 12.8	, i	22.4 July 37.2 40	.: 40.0 35.3 30.2 36.2 1.0 20.0
17.6		30.6 4.6 36.7 33	.7. 37.7 38.1 37.5 33.0 28.2 35.2 .6. 35.5 34.6 33.1 32.8 31.3 28.0 28.0 37.0 .0. 30.5 37.4 48.5 38.4 39.5 37.0 37.0 37.0 37.1
12.8 6.4		422.6' B ₁₂₁ 8.0 32.1 3	12 30.5 27.6 25.7 24.8 26.1 25.6 26.4 27.5 20.
C ₁₂ 207.3'	76.1° C3	27.4 50.0 22.4 50.0 22.7 10.0 31.7 22	.e 26.4 25.5 21.6 21.0 25.1 26.6 51.6 56.5 56.6 753 7
394.7	390.8	412.9' A1 42.0 40.0 49.5 42	.9 1812 28.0 23.0 23.2 28.3 20.4 26.2 40.5 41.5 12.5 24.1 40.5 41.5 12.5 24.1 40.5 41.5 12.5 24.1 40.5 41.5 12.5 24.1 40.5 41.5 12.5 24.1 40.5 41.5 12.5 24.1 40.5 41.5 12.5 24.1 40.5 41.5 41.5 41.5 41.5 41.5 41.5 41.5 41
	α		.8 51.3 33.7 58.8 27.7 30.2 34.3 37.5 38.6 38.7 39.7 37.6 58.0 (4 47.4 37.9 38.2 27.7 29.8 33.5 37.3 37.4 38.6 38.1 37.2 27.5
1	107.2 165.9 197.3 V4 B3 32	20.3' A ₃	4 421 307 243 243 244 4 3 10 224 243 243 243 243 243 243 243 243 243
C_{11} $\int_{386.1'}$		504.0	<u>— — — — — — — — — — — — — — — — — — — </u>
22	(a)	248.3	243.7
	207.6	412.8° A6	
54.55		143.8	J 754.0
B8	A9 162.7' B9	425.5' B6	♦ —
	51.8	- -	76.8'
S S S S S S S S S S		32.3	
\[\frac{92}{57.9'} \]			
<u>∳</u> ♣			13.1
	292.0	C9	569.3 C6 P a
B7 67.6'			684.6'
272.9			
	299		311.0
C7 212.2'	106.7' C10	l	• • • • • • • • • • • • • • • • • • •
			573.6' S3 684.6' S2

Fixture Type: Lamp Type: Lumens: TLC MZ/TLC MZ 1500W MZ/1500W MZ 155000

File # / Date: Prepared By: 105273wwc / 18-Feb-2004 MBELLOMA



MAINTAINED ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	183
Average:	50.10	30.18
Maximum:	58.58	41.50
Minimum:	35.57	16.91
Avg/Min:	1.409	1.784
Max/Min:	1.647	2.454
UG (Adj pts)	1.238	1.651
CV:	0.118	0.191

Number of Luminaires: 44
* KW Consumption: 462.40

**Average Tilt Factor: 0.971

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.777

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

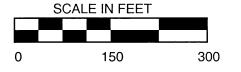
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

80'

70'

70'

50'

50'

Mounting Pole

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

80'

70'

70'

70'

Pole

count

1

1

2

3

5

6

3

4

Pole

location

A1

А3

A5

A6

A8

A9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

Pole Fixt. Kilow size Elev. /unit /unit

0' 8

0' 8

0' 4

0' 8

0' 4

0' 8

0' 4

0' 20

0' 10

0' 21

0' 20

0' 11

0' 8

0' 11

0' 8

50' 0' 4

50' 0' 2

60' 0' 4

^{*}Refer to amperage draw for electrical sizing.

^{**} Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

	LIOI	IING	l			
g	Pole size	Elev.	Fixt. /unit	Kilow /unit		
	60'	0'	8	12.8		
	60'	0'	4	6.4		
	60'	0'	8	12.8		
	60'	0'	4	6.4		
	60'	0'	8	12.8		
	60'	0'	4	6.4		
	60'	0'	8	12.8		
	60'	0'	4	6.4		
	80'	0'	20	32	>	
	80'	0'	10	16	2 52.5' C ₄	5 77.1' C ₁
	80'	0'	21	33.6		
	80'	0'	20	32		86.4
	80' 70'	0' 0'	11	17.6	'_4	ا يط
	70'	0'	8	12.8 17.6		
	70'	0'	8	12.8		22.6 B ₁
	50'	0'	4	6.4		22.6' B1
	50'	0'	2	3.2	007.01	45
			<u> </u>	0.2	C ₁₂ 207.3' 76.1' C ₃	(Z2) 755人 C2
						₩
					390.82	2.9° A1
						\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
					B ₅ 81.0'	330,4
					1070° 1050° 19 3 200° A	4 005 71 2
				_	17 18	504.0 A ₅ 635.7 B ₂
				C ₁₁	74.1'	ф <u></u>
				4 2	74.1'	243.7
				219.6	$A_{12} = \underbrace{\begin{array}{c} 60.7 \\ 60.7 \end{array}} $	
					Q 62	2.8' A6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
					154:53	Φ A 2
				L		143 1
					$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
					$\begin{array}{cccccccccccccccccccccccccccccccccccc$	125.5 ⁷ B ₆ 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
						125.5' B6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
				_		
					31,2 4	
				1	1 1 - V 1 1	
				97	A10 57.9	31
				₩.		"
				97.4° C8	1	131
				00	<u> </u>	569.3' C6 31
					\	684.6' S1
					D7 (67.6')	
					277.9	
						311.00
					C7 212.2' 106.7' C10	0 0 1
					1 <u>06.7'</u> U10	_{573.6'} S3 _{684.6'} S2
						573.6' 53 684.6' 52

Fixture Type: Lamp Type: Lumens: File # / Date:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273wwc / 18-Feb-2004

MBELLOMA Prepared By:



INITIAL ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: Average: Maximum: Minimum: Avg/Min: Max/Min:	Infield 25 63.39 76.04 44.59 1.422	Outfield 183 37.75 51.71 20.82 1.814 2 484

Number of Luminaires: 'KW Consumption: 462.40

**Average Tilt Factor: 0.970
***Recoverable Light Loss Factors: x 1.000 Total Light Loss Factor(LLF) 0.970

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

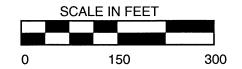
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 \rightarrow = Pole Location



EQUIPMENT LISTING

height

60'

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

80'

70'

70'

50'

50'

Mounting Pole

Pole

count

1

2

3

1

1

5

6

3

4

Pole

location

A1

А3 A5

A6

A8

A9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

height	size	Elev.	/unit	/unit		
60'	60'	0'	8	12.8		
60'	60'	0'	4	6.4		
60'	60'	0'	8	12.8		
60'	60'	0'	4	6.4		
60'	60'	0'	8	12.8		
60'	60'	0'	4	6.4		
60'	60'	0'	8	12.8		
60'	60'	0'	4	6.4		
80' 80'	80' 80'	0'	20 10	32 16	252.5° C4	
80'	80'	0,	21	33.6	252.5' \ C4	577.1' C1
80'	80'	0'	20	32	95 ·	
80'	80'	0'	11	17.6		86.4
70'	70'	0'	8	12.8		
70'	70'	0'	11	17.6		\
70'	70'	0'	8	12.8	422.6° B1	
50'	50'	0'	4	6.4		
50'	50'	0'	2	3.2	C_{12} $207.3'$ $76.1'$ C_3	⁷⁵⁵ √ C ₂
						₩
					412.9' A1	
						<u> </u>
					B ₅ 81.0')
					1	
				_	\$ 504.0	A5 635.7' B2
				C ₁₁	1/380.1 ib	Φ
						243.7
				219.6'	$A_{12} = \begin{bmatrix} 60.7' \\ 60.7' \\ \end{bmatrix} \begin{bmatrix} 60.7' \\ 8 \\ \end{bmatrix}$	21.0 21.0 21.0 21.0 21.0 21.0 21.0 21.0
				-	/ I I——————————————————————————————————	5.4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
						C5
					D8 270.4 A8 146.4' 25.0' A =	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
					$\begin{array}{cccccccccccccccccccccccccccccccccccc$	76.8"
						& 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1
				7	ی بπن اس حالت است است است است است است است است است اس	24.5
				1		10 10 10 10 10 10 10 10 10 10 10 10 10 1
				,		
				97.4. C8	A10 57.9'	3
			Ĭ	-	★ □	131.13
				C8	<u></u>	
						569.3
					B7 67.6'	684.6'
					2772.9	
						311.0
					C7 212.2 $C10$	0 0 -
					1 <u>06.7'</u> C10	_{573.6′} S3 _{684.6′} S2
						$\frac{573.6'}{}$ $33 \frac{684.6'}{}$ 32

Fixture Type: Lamp Type: Lumens: TLC MZ/TLC MZ 1500W MZ/1500W MZ

is: 155000

File # / Date: 105273wwc / 18-Feb-2004 Prepared By: MBELLOMA



MAINTAINED ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	183
Average:	50.71	30.20
Maximum:	60.83	41.37
Minimum:	35.67	16.65
Avg/Min:	1.422	1.814
Max/Min:	1.705	2.484
UG (Adj pts)	1.256	1.730
CV:	0.120	0.205

Number of Luminaires: 44
* KW Consumption: 462.40

**Average Tilt Factor: 0.970
***Recoverable Light Loss Factors: x 0.800
Total Light Loss Factor(LLF) 0.776

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

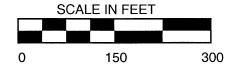
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 \Rightarrow = Pole Location



EQUIPMENT LISTING

Mounting Pole Fixt. Kilow

Pole count

2

3

1

5

6

3

4

Pole

location

A1

A3 A5 A6 A8 A9 A10

B1-B2

B3-B6 B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

00	U	0	12.0	
60'	0'	4	6.4	
60'	0'	8	12.8	
60'	0'	4	6.4	
60'	0'	8	12.8	
60'	0'	4	6.4	
60'	0,			
		8	12.8	
60'	0'	4	6.4	
80'	0'	20	32	 -
80'	0'	10	16	252.5' C ₄ 577.1' C ₁
80'	0'	21	33.6	
80'	0'	20	32	588.4
80'	0'	11	17.6	88.4.
70'	0'	8	12.8	
70'	0'	11	17.6	
70'	0,	8	12.8	422.6' B ₁
50'	0'	4	6.4	
50'	0,	2	3.2	$C_{12} = \frac{207.3'}{76.1'} = C_3$
				C_{12} $207.3'$ $76.1'$ C_3 \mathfrak{S} \mathfrak{S}
				<u> </u>
				412.9' A1
				1 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3
				10 m m m m m m m m m m m m m m m m m m m
			C ₁	1 /3864' a a a a a a a a a a a a a a a a a a a
				\mathcal{N}
			219.6	
			9.6	
				/ a s t d d d d d d d d d d d d d d d d d d
				754.0' A9 1627' Do
				754.0' C5
				A10 57.9'
			97.4'	A10 57.9'
			C8	
				292.0
				D/ 67.6'
				2772.9
				C7 212.2' 106.7' C10
				100.7
				573.6' S3 684.6' S2
				— → I ———I

Fixture Type: Lamp Type: Lumens:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000 File # / Date:

105273wwc / 18-Feb-2004

Prepared By: **MBELLOMA**



INITIAL ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3
BASEBALL
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	175
Average:	62.91	38.60
Maximum:	73.77	54.92
Minimum:	49.41	22.35
Avg/Min:	1.273	1.727
Max/Min:	1.493	2.457
UG (Adj pts)	1.275	1.555
CV:	0.116	0.191

Number of Luminaires: KW Consumption: 462.40

**Average Tilt Factor: 0.969

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.969

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 $-\Phi$ = Pole Location



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

70'

70'

70'

50'

50'

Mounting Pole

Pole | Fixt. Kilow | size | Elev. | /unit | /unit

60' 0' 8 12.8

Pole count

2

5

6

3

location

A1

A3

A5

A6

A8

A9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

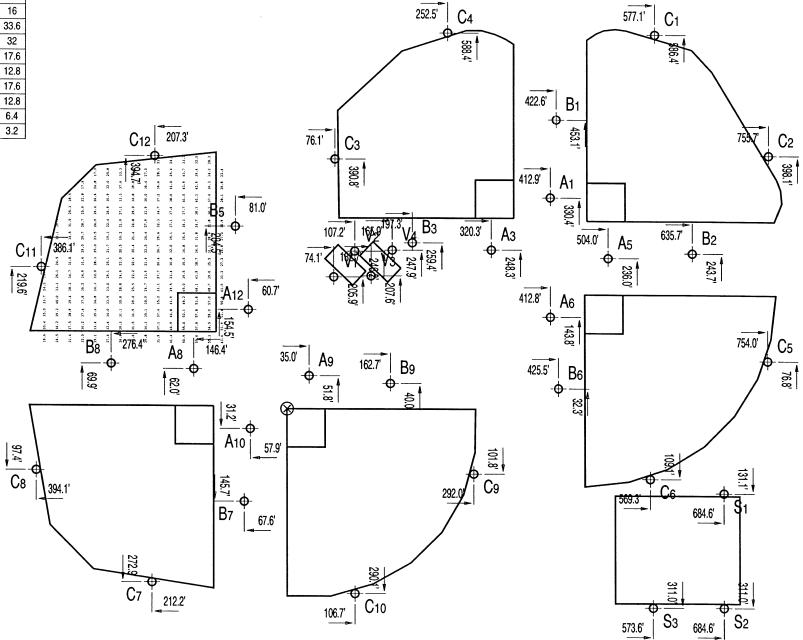
C6

C7-C12

S1-S3

^{*}Refer to amperage draw for electrical sizing.

EQUI	PMENT	LIST	ΓING			
ole Pole	Mounting	Pole		Fixt.	Kilow	
unt location	height	size	Elev.	/unit	/unit	
1 A1	60'	60'	0'	8	12.8	
1 A3	60'	60'	0'	4	6.4	
1 A5	60'	60'	0'	8	12.8	
1 A6	60'	60'	0'	4	6.4	
1 A8	60'	60'	0'	8	12.8	
1 A9	60'	60'	0'	4	6.4	
1 A10	60'	60'	0'	8	12.8	
1 A12	60'	60'	0'	4	6.4	
2 B1-B2	80'	80'	0'	20	32	
3 B3-B6	80'	80'	0'	10	16	
1 B7	80'	80'	0'	21	33.6	
1 B8	80'	80'	0'	20	32	
1 B9	80'	80'	0'	11	17.6	
5 C1-C5	70'	70'	0'	8	12.8	
1 C6	70'	70'	0'	11	17.6	
6 C7-C12	70'	70'	0'	8	12.8	
3 S1-S3	50'	50'	0'	4	6.4	
4 V1-V4	50'	50'	0'	2	3.2	C ₁₂ 20
3 S1-S3	5	0'	0' 50'	0' 50' 0'	0' 50' 0' 4	0' 50' 0' 4 6.4



Fixture Type: Lamp Type: Lumens: File # / Date:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273wwc / 18-Feb-2004 MBELLOMA

Prepared By:



MAINTAINED ILLUMINATION
BASEBALL
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

Torget Deinter	Infield_ 25	Outfield 175
Target Points:		
Average:	50.33	30.88
Maximum:	59.02	43.93
Minimum:	39.53	17.88
Avg/Min:	1.273	1.727
Max/Min:	1.493	2.457
UG (Adj pts)	1.275	1.555
CV:	0.116	0.191

Number of Luminaires: KW Consumption: 462.40

***Average Tilt Factor: 0.969

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.775

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 $- \Phi = Pole Location$



^{*}Refer to amperage draw for electrical sizing.

^{**} Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

^{***} Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

754.0'

684.6'

count location height size Elev. /unit /unit 1 A1 60' 60' 0' 8 12.8 1 A3 60' 60' 0' 4 6.4 1 A5 60' 60' 0' 4 6.4 1 A6 60' 60' 0' 4 6.4 1 A8 60' 60' 0' 4 6.4 1 A9 60' 60' 0' 4 6.4 1 A10 60' 60' 0' 4 6.4 1 A12 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 20 32 1 B8 80' 80'						- -	
1 A1 60' 60' 0' 8 12.8 1 A3 60' 60' 0' 4 6.4 1 A5 60' 60' 0' 4 6.4 1 A6 60' 60' 0' 4 6.4 1 A8 60' 60' 0' 4 6.4 1 A9 60' 60' 0' 4 6.4 1 A10 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 20 32 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0'	Pole	Pole	Mounting	Pole	Flev	Fixt.	Kilow
1 A3 60' 60' 0' 4 6.4 1 A5 60' 60' 0' 8 12.8 1 A6 60' 60' 60' 0' 4 6.4 1 A8 60' 60' 0' 0' 4 6.4 1 A9 60' 60' 60' 0' 4 6.4 1 A10 60' 60' 60' 0' 4 6.4 1 A12 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 </td <td></td> <td></td> <td>60'</td> <td>60'</td> <td></td> <td></td> <td>12.8</td>			60'	60'			12.8
1 A5 60' 60' 0' 8 12.8 1 A6 60' 60' 0' 4 6.4 1 A8 60' 60' 0' 4 6.4 1 A9 60' 60' 60' 0' 4 6.4 1 A10 60' 60' 60' 0' 4 6.4 1 A12 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 21 33.6 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 11 17.6 6 C7-C12 <t< td=""><td>1</td><td></td><td><u> </u></td><td></td><td>+</td><td>_</td><td>6.4</td></t<>	1		<u> </u>		+	_	6.4
1 A8 60' 60' 0' 8 12.8 1 A9 60' 60' 60' 0' 4 6.4 1 A10 60' 60' 60' 0' 4 6.4 1 A12 60' 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 8 12.8 3 S1-	1	A5	60'	60'	0'	8	12.8
1 A9 60' 60' 0' 4 6.4 1 A10 60' 60' 0' 8 12.8 1 A12 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 70' 0' 8 12.8 1 C6 70' 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4	1		60'	60'	0'	4	6.4
1 A10 60' 60' 0' 8 12.8 1 A12 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2	1				0'	8	12.8
1 A12 60' 60' 0' 4 6.4 2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2						4	6.4
2 B1-B2 80' 80' 0' 20 32 3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2						_	12.8
3 B3-B6 80' 80' 0' 10 16 1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2				_	_	+	
1 B7 80' 80' 0' 21 33.6 1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2			1				
1 B8 80' 80' 0' 20 32 1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2							
1 B9 80' 80' 0' 11 17.6 5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2					+		
5 C1-C5 70' 70' 0' 8 12.8 1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2							
1 C6 70' 70' 0' 11 17.6 6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2	1					+	
6 C7-C12 70' 70' 0' 8 12.8 3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2	-						
3 S1-S3 50' 50' 0' 4 6.4 4 V1-V4 50' 50' 0' 2 3.2	-				_	_	
4 V1-V4 50' 50' 0' 2 3.2							
C							
C	4	V1-V4	50'	50'	0'	2	3.2
C							
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) VRI V							C ₁
180							-01
90							∮ ≥
							9.6
							•

57.9'

67.6'

C10

106.7'

212.2'

101.8

Fixture Type: Lamp Type: Lumens:

TLC MZ/TLC MZ 1500W MZ/1500W MZ 155000

File # / Date: 10 Prepared By: MI

155000 105273wwc / 18-Feb-2004 MBELLOMA



INITIAL ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3
BASEBALL
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	176
Average:	63.42	38.34
Maximum:	74.70	51.50
Minimum:	42.16	23.26
Avg/Min:	1.504	1.648
Max/Min:	1.772	2.214
UG (Adj pts)	1.335	1.643
CV:`´´	0.135	0.186

Number of Luminaires: 44
* KW Consumption: 462.40

**Average Tilt Factor: 0.970

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.970

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING

^{*}Refer to amperage draw for electrical sizing.

684.6'

S₃

	252.5	C4	577.1' C1	
		422.6' B ₁	١ڃ٠	
C ₁₂ 207.3'	76.1' C3	412.9 A1		7537 C ₂
386.1' B5 81.0'	107.2' 167.9 ^{197.3} V B3	320.3' A3 50	$ \begin{array}{c c} & & & \\ \hline 4.0' & A5 & & \\ \hline & & & \\ \end{array} $)
A12 60.7'	7,9	82 412.8' A6 1	243.7	
$ \begin{array}{c c} B8 & 2^{76.4} \\ \hline & 8 & 4^{146.4} \end{array} $ $ \begin{array}{c c} \hline & A8 & 146.4' \\ \hline & 8 & 4^{146.4'} \end{array} $	$ \begin{array}{c c} \hline A9 & 162.7' & B9 \\ \hline & & & & \\ \hline &$	425.5' B6		754.0' C5
2 AFEZ DIZZ BER ZEHE ZEHE ZEHE ZEHE ZEHE ZEHE ZEHE ZE	9	32 O C9	100	/ ا
394.15 are successful and all the first out of the first out out of the first out of the fir	2	$_{92.0}$ $\overline{\text{C}_9}$	C6 +	31.1.↓ ■

67.6'

C10

106.7'

212.2'

Fixture Type: Lamp Type: Lumens: File # / Date:

TLC MZ/TLC MZ 1500W MZ/1500W MZ 155000 105273wwc / 18-Feb-2004

Prepared By: **MBELLOMA**



MAINTAINED ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	176
Average:	50.74	30.67
Maximum:	59.76	41.20
Minimum:	33.73	18.61
Avg/Min:	1.504	1.648
Max/Min:	1.772	2.214
UG (Adj pts)	1.335	1.643
CV: ` ´ ´	0.135	0.186
• • • • • • • • • • • • • • • • • • • •		

Number of Luminaires: 462.40 * KW Consumption: **Average Tilt Factor: 0.970
***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.776

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

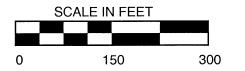
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

50'

Mounting Pole

height size Elev. /unit /unit

0'

0'

0'

0'

0'

0'

0'

0'

0'

0'

50' 0' 4 6.4

50' 0' 2 3.2

0' 4

0' 20

8 12.8

8 12.8

4 6.4

8 12.8 6.4

8 | 12.8

21 | 33.6

11 17.6

11 17.6

97.4'

C₈

32

16

4

10

20 32

0' 8 12.8

0' 8 12.8

0' 4 6.4

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

70'

70'

Pole

count

2

3

5

6

3

4

location

A1

A3 A5

A6

A8

Α9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

^{*}Refer to amperage draw for electrical sizing.

^{**} Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

e it	Pole location	Mounting height	Pole size	Elev. /uni	Kilow /unit											
	A1	60'	60'	0' 8	12.8											
	A3	60'	60'	0' 4	6.4											
-	A5 A6	60' 60'	60' 60'	0' 8	12.8											
\dashv	A8	60'	60'	0' 4	6.4 12.8											
7	A9	60'	60'	0' 4	6.4											
	A10	60'	60'	0' 8	12.8											
_	A12	60'	60'	0' 4	6.4											
-	B1-B2 B3-B6	80' 80'	80'	0' 20 0' 10	32					050.51	_					
+	B7	80'	80'	0' 10 0' 21	16 33.6					252.5'	C4		5	77.1' C1		
	B8	80'	80'	0' 20	32						$\widehat{\mathbb{S}^{+}}$			The second	Ī	
	B9	80'	80'	0' 11	17.6						588.4			86.4		
4	C1-C5	70'	70'	0' 8	12.8											
-	C6 C7-C12	70' 70'	70' 70'	0' 11 0' 8	17.6 12.8							422.6' B				
-	S1-S3	50'	50'	0' 4	6.4							^{422.6} ' В	<u> </u>			
	V1-V4	50'	50'	0' 2	3.2	C40	207.3'		76.1' C3			Ψ	A A		755.7	Co
						U12 ——-	201.0	1	^{76.1'} ☐ C3			=	=		,,,,	\h
						394.7			390.8'			440.0	-			<u>88.</u>
						1.7).8′			412.9' A1) <u>-</u>
						ſ	þ	5 81.0'				→ —	-)
						1	-	- -	107.2	66.9 ^{197.3} V4 B3	320.3' A ₃	330.4'				/
					٠.	, 1 386 1'	407	5	107.2	Y		1	504.0' A	635.7°	i —-	
					U1	386.1'	۱۷	72	74.1'	25.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.	• — 248.3	<u>†</u>	A -			
					23	Y			•		ယ္		0.0	38.0	243.7'	
					၂ တို့	1	Γ	A ₁₂ 60.7'	£05.9)	207.6		412.8' A6				
						/		φ	•	-		ф.—	-1 1			- 1
								154.5				[▼] 143.8	.↑		754.0	-/-
						B8 276.4'	A8 14	6.4' 35	0' 10				'		754.0	/ C5
						69.9			.0' A9 1	62.7' B9		425.5' E	36			76.8'
						9.9	E2.0			Φ					/	, 96 96
					1			31.2'	# # [04] # # # # # # # # # # # # # # # # # #	40.0	23.8		ჯ აკ			
						\			5 55.5		3 30.1		Į.			
					9	1	<u> </u>	A10 57.9	2 S S S S S S S S S S S S S S S S S S S	6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6						
					97.4'	A				12 12 14 15 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	101.8			<u>ş</u>	/	
					C ₈	204 1'		-4	28.1 2 2 2 2 4 4 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	31.5.4.5.6.5.6.5.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7	7 0			1	131.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
						394.1'		1 1 + 1	25 25 27 27 27 27 27 27 27 27 27 27 27 27 27	8	2.7		[56	59.3' \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	• a .	
						\		B7 67.6'			/		-	1	684.6'	
								l ⊸ — :	35.0 34. 35.6 34. 35.6 34. 36. 34.							
						17/2		5 35.0	* * * * * * * * * * * * * * * * * * * *							
						272.9	_	28.6 21	34.5 21 35.7 28 41.5 35 43.0 39 36.4 31	296			1			
							040.01	۔ ا		ایکنر				311.0	<u> </u>	
						O1	212.2'		106.7'	C ₁₀			L	-0-	+ + E	
									-				5	73.6' S3	684.6' S2	

Fixture Type: Lamp Type:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

Lumens: File # / Date:

155000 105273wwc / 18-Feb-2004

Prepared By: MBELLOMA



INITIAL ILLUMINATION
BASEBALL
HORIZONTAL FOOTCANDLES
ON PLANE AT $Z=3$

	<u>Infield</u>	<u>Outfield</u>
Target Points:	25	185
Average:	63.53	37.94
Maximum:	74.81	55.49
Minimum:	47.10	22.35
Avg/Min:	1.349	1.697
Max/Min:	1.588	2.483
UG (Adj pts)	1.215	1.668
CV: ` ´ ´	0.114	0.185

Number of Luminaires: 46
* KW Consumption: 462.40

**Average Tilt Factor: 0.969

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.969

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

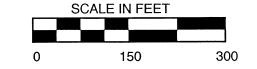
*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING

Pole count

1

	00	U	۰	12.6	
	60'	0'	4	6.4	
	60'	0'	8	12.8	
_]	60'	0'	4	6.4	
	60'	0'	8	12.8	
	60'	0'	4	6.4	
	60'	0'	8	12.8	
	60'	0'	4	6.4	
	80'	0'	20	32	
	80'	0'	10	16	252.5 C ₄ 577.1 C ₁
	80'	0'	21	33.6	C_4 C_4 C_1
	80'	0'	20	32	
	80'	0'	11	17.6	588.4.
	70'	0'	8	12.8	
	70'	0'	11	17.6	
	70'	0'	8	12.8	422.6 B1
	50'	0'	4	6.4	
	50'	0'	2	3.2	
					C_{12} $76.1'$ C_3 $207.3'$ C_2
					4
					412.9' A1
					1
				_	$\frac{1}{4}$ $\frac{107.2 \cdot \sqrt{2} \cdot \sqrt{4} \cdot \sqrt{2} \cdot$
				C1	
				1	74.1'
				219.6	$A_{12} = \begin{bmatrix} 60.7 \\ \hline & & \\ & $
				1 02	$A_{12} = \underbrace{\begin{array}{c} 60.7 \\ 60.7 \end{array}} $
				1	
				L	
					B8 2/6.4'
					$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
					$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
				7	31 12 A10 57.99 8 10 10 10 10 10 10 10 10 10 10 10 10 10
				1	
				1	
				97.4'	A10 57.95
				C ₈	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
					1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
					B7 684.6' S1
					272.9
					100 7' \(\text{U10} \)
					573.6' S3 684.6' S2
					<u> </u>

Fixture Type: Lamp Type: Lumens: File # / Date:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273wwc / 18-Feb-2004 **MBELLOMA** Prepared By:



MAINTAINED ILLUMINATION BASEBALL HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

	Infield	Outfield
Target Points:	25	185
Average:	50.82	30.35
Maximum:	59.85	44.39
Minimum:	37.68	17.88
Avg/Min:	1.349	1.697
Max/Min:	1.588	2.483
UG (Adj pts)	1.215	1.668
CV:	0.114	0.185

Number of Luminaires: 46 KW Consumption: 462.40

**Average Tilt Factor: 0.969
***Recoverable Light Loss Factors: x 0.800 Total Light Loss Factor(LLF) 0.775

*Refer to amperage draw for electrical sizing.

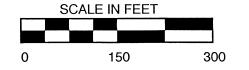
- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 $-\Phi$ = Pole Location



EQUIPMENT LISTING

height

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

80'

70'

70'

70'

50'

50'

Mounting Pole

60'

Pole

count

1

1

1

1

1

1

1

2

3

1

5

1

6

3

4

Pole

location

A1

A3

A5

A6

A8

Α9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

Pole Fixt. Kilow size Elev. /unit /unit

0' 8 12.8

		IVILIVI	LIO			j		
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow		
1	A1	60'	60'	0'	8	12.8		
1	A3	60'	60'	0'	4	6.4		
1	A 5	60'	60'	0'	8	12.8		
1	A6	60'	60'	0'	4	6.4		
1	A8	60'	60'	0'	8	12.8		
1	A 9	60'	60'	0'	4	6.4		
1	A10	60'	60'	0'	8	12.8		
1	A12	60'	60'	0'	4	6.4		
2	B1-B2	80'	80'	0'	20	32		
3	B3-B6 B7	80'	80'	0'	10	16	252.5' C ₄ 577.1' C ₁	
1 1	B8	80' 80'	80'	0'	21	33.6 32		
1	B9	80'	80'	0,	11	17.6	588,4	
5	C1-C5	70'	70'	0,	8	12.8		
1	C6	70'	70'	0,	11	17.6		
6	C7-C12	70'	70'	0'	8	12.8	422.6' B1	
3	S1-S3	50'	50'	0'	4	6.4	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
4	V1-V4	50'	50'	0'	2	3.2	C ₁₂ 207.3' 76.1' C ₃	7' 0
							$\begin{array}{c c} C_{12} & 207.3 & 76.1' & C_3 & & & & & & & & & & & & & & & & & & &$	C2
							412.9' A1	Z Z
							412.9' A1	721
)
								/
							107.2' $189.5'$ $107.2'$ $189.5'$ $107.2'$ $189.5'$ $107.2'$ 1	
						C ₁	1 /300. 1/2	
						219.6'		
						၊ တ	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	7
						ı	'	-
							$B_8 \mid 276.4' A_0 \mid 146.4' \qquad {} (54.0)$	0' / C ₅
								<i>₱</i>
								76.8'
						_	/ (#) [3] (#) [4] (
						1		
						,		
						97	A10 57.9 S	
						97.4'		ı
						C8	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
							$\begin{array}{c c} & & & & & & \\ \hline & & & & & \\ \hline & & & & \\ \hline \end{array}$	<u>-</u>
							$ \begin{array}{c c} \hline $	
							B7 67.6'	
							9	1
							C7 $212.2'$ $106.7'$ $C10$	ļ
							10C 7' U10	<u>-</u>
							$\frac{100.7}{573.6'}$ S3 $_{684.6'}$ S2	

Fixture Type: TLC MZ/TLC MZ
Lamp Type: 1500W MZ/1500W MZ
Lumens: 155000
File # / Date: 105273wwc / 18-Feb-2004
Prepared By: MBELLOMA



INITIAL ILLUMINATION
RECTANGLE
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

 Target Points:
 18

 Average:
 66.54

 Maximum:
 84.57

 Minimum:
 46.97

 Avg/Min:
 1.417

 Max/Min:
 1.800

 UG (Adj pts)
 1.355

 CV:
 0.172

Number of Luminaires: 4
* KW Consumption: 462.40

**Average Tilt Factor: 0.842

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.842

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING

		PIMEINI	LIS I	IING						-		_,	
Pole count	Pole location	Mounting height	Pole	Flev	Fixt. Kilov /unit /unit								
1	A1	60'	60'	0'	8 12.8								
1	A3	60'	60'	0'	4 6.4								
1	A 5	60'	60'	0'	8 12.8								
1	A6	60'	60'	0'	4 6.4								
1	A 8	60'	60'	0'	8 12.8								
1	A9	60'	60'	0'	4 6.4								
1	A10	60'	60'	0'	8 12.8								
1	A12	60'	60'	0'	4 6.4								
2	B1-B2	80'	80'	0'	20 32								
3	B3-B6	80'	80'	0'	10 16				252.5'	C 4		577.1' C	4
1	B7	80'	80'		21 33.6				•		_		<u></u>
1	B8	80'	80'		20 32	1				58,4	ſ	7	*
1	B9	80'	80'		11 17.6				/	4-		3	86 A.
5	C1-C5	70'	70'	0'	8 12.8						ļ		
1	C6	70'	70'		11 17.6						100 0		
6 3	C7-C12 S1-S3	70'	70'	0'	8 12.8	4					^{422.6} ′ B1		
4	V1-V4	50' 50'	50' 50'	0'	4 6.4 2 3.2	- I →					+ +		→
	V 1-V-4	30	30	0	2 3.2	C ₁₂ 207.3'		76.1' C3			453.1		75 3 7' C2
							1	d			- 1		₩
						394.7		390.8		۱,	12.9' A1		Z 3 1
						7		8		— ["	1		/
							5 81.0				Φ ω)
						/	§5 81.0°		77 2' D.		30,4		
						<u> </u>	Ψ	107.2' 165.9'	^{197.3} V ₄ B ₃	320.3' A3	504.	0' A 5 635	5.7' B2
					C	11 386.1'	9 T 9 A 1.		x + + + + + + + + + + + + + + + + + + +	A	304.	, W 2	<u> </u>
						A		74.1'	259,4	248.3'		• • •	*************************************
					219.6	: 7	—	\$\sqrt{\phi}	∀ , © '			236.0	3.7
					lo	- /	A ₁₂ 60.7'	¥05.9	207.6	4	12.8' A6 F		
						/	- Φ	Q,	Og (1		1
							₩ 15.5.				Φ =		
						B8 276.4' A8 14		— ► 1			143.8		754.0' C ₅
						A8 11	6.4' 35	0' A9 162.7'			I		A
						, •		02.7	B ₉		425.5' B6		76.8
						1 🔍		51.8	$\Phi \overline{}$		$\Phi - \downarrow$		يق
							ાલ છ	, α _ί Ι	40.0		32.33 32.33		
						\	H H H H H H H H H H H H H H H H H H H	'			اا		
						\	Δ101						
					97.4'		A10 57.9'			=		-	
						-d				09.8			===
					C ₈	394.1'	145.7		***	$\sqrt{\frac{C_9}{C_9}}$	L		<u></u>
						1 1007.1			292.0			569.3	o
						\	B7 _{67.6'}		/				684.6' 31
												l	
						272.9			. /				
						10		290					İ

Fixture Type: Lamp Type: Lumens: File # / Date:

Prepared By:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273wwc / 18-Feb-2004 **MBELLOMA**



MAINTAINED ILLUMINATION RECTANGLE HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: 53.23 Average: Maximum: 67.65 Minimum: 37.58 Avg/Min: 1.417 1.800 Max/Min: UG (Adj pts) 1.355 CV: 0.172

Number of Luminaires: 462.40 * KW Consumption:

Average Tilt Factor: 0.842 *Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.674

*Refer to amperage draw for electrical sizing.

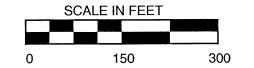
- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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→ = Pole Location



EQUIPMENT LISTING

	Size	Elev.		/uriit		
	60'	0'	8	12.8		
	60'	0'	4	6.4		
	60'	0'	8	12.8		
	60'	0'	4	6.4		
-	60'	0'	8	12.8		
-	60'	0'	4	6.4		
-	60'	0'	8	12.8		
-	60'	0'	4	6.4		
-	80'	0'	20	32		
_					252.5° C ₄	
	80'	0'	10	16	252.5' C ₄	577.1° C1
	80'	0'	21	33.6		
	80'	0'	20	32	588.4	1,38
	80'	0'	11	17.6		
	70'	0'	8	12.8		
	70'	0'	11	17.6	400 0	_ \
	70'	0'	8	12.8	422.6	B ₁
	50'	0'	4	6.4	φ	
	50'	0'	2	3.2	C_{12} 76.1 C_3	7557 C ₂
					C12 207.3' 76.1' C3	
					412.9	\1 \ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
					B ₅ 81.0'	330.4.
					→ • • • • • • • • • • • • • • • • • • •	0.4
						504.0' A ₅ 635.7' B ₂
				C1		7.0
						243.7
				219.6		243.7'
				တ်	A12 60.7' 88 12.8' 412.8'	46
				- 1	1.54 by	<u></u>
				•	B8 276.4' Ap 146.4'	₹ 754.0° C5
					B8 276.4' A8 146.4' 35.0' A9 169.7' B	1
					$\begin{array}{cccccccccccccccccccccccccccccccccccc$	B6 76 8
						/ 6.8
						<u>k</u> y
				1	31.2	35.5°
				,	$\left \begin{array}{c} \left \frac{\sqrt{1-x}}{2} + \frac{\sqrt{x}}{2} \right \\ \left \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} \\ \left \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} \\ \left \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} \\ \left \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2} \\ \left \frac{\sqrt{x}}{2} + \frac{\sqrt{x}}{2}$	
				100	1 1 / 1 / 1 1 1 1 1 1 1 1	
				97.4' C8	A10 57.9' 394.1' A10 57.9' C9 C9	50/
				<u>'</u>	♦	31.1
				C8	√394.1′	
						569.3
					B7 67.6'	684.6' 31
					D/ 67.6'	
					2729	
					C7 212 2'	311.0
					106.7′ U10	$S_3 \longrightarrow S_2$

Fixture Type: Lamp Type: Lumens:

TLC MZ/TLC MZ 1500W MZ/1500W MZ 155000

File # / Date: Prepared By:

105273wwc / 18-Feb-2004 MBELLOMA



INITIAL ILLUMINATION RECTANGLE HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: 64.93 Average: 79.81 Maximum: 47.63 Minimum: 1.363 Avg/Min: Max/Min: 1.676 UG (Adj pts) 1.313 0.149

Number of Luminaires: 462.40 * KW Consumption: **Average Tilt Factor: 0.844

***Recoverable Light Loss Factors: x 1.000 Total Light Loss Factor(LLF) 0.844

- *Refer to amperage draw for electrical sizing.
- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 \Rightarrow = Pole Location



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

70'

70'

70'

50'

50'

count

2

3

5

6

3

4

location

A1

A3

A5

A6 A8

A9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

size Elev. /unit /unit

_{573.6'} S3 _{684.6'} S2

			IING		l		
Pole location	Mounting height	Pole	Elev.	Fixt. /unit	Kilow /unit	W t	
A1	60'	60'	0'	8	12.8		
A3	60'	60'	0'	4	6.4		
A 5	60'	60'	0'	8	12.8		
A6	60'	60'	0'	4	6.4		
A8	60'	60'	0'	8	12.8		
A9	60'	60'	0'	4	6.4		
A10	60'	60'	0'	8	12.8		
A12	60'	60'	0'	4	6.4		
B1-B2	80'	80'	0,	20	32		
B3-B6	80'	80'	0'	10	16		
B7	80'	80'	0'	21	33.6		
B8	80'	80'	0'	20	32		
B9	80'	80'	0'	11	17.6		\
C1-C5	70'	70'	0'	8	12.8		
C6 C7-C12	70' 70'	70'	0' 0'	11	17.6	$\frac{1}{422.6}$	
S1-S3	50'	50'	0,	8	12.8 6.4		
V1-V4	50'	50'	0,	2	3.2	─	
V 1-V-4	30	30			0.2	C_{12} $207.3'$ $76.1'$ C_3	75 3 -7' C2
							₩
						412.9° A1	38.1
							/
						81.0')
						1 1973 Po 1 1973 Po 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
						$107.2' \mid 100.2' \mid 100.2' \mid 100.2' \mid A3$ $320.3' \mid A3$ $504.0' \mid A_5$ $635.7' \mid 1$	B2
					C1	71 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
							243.7
					219.6		71
					၂ တ	$\begin{array}{c c} A_{12} & $	
					I		
						Ba 2/6.4'	754.0' C5
						- $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$	<i>₱</i> ,
							76.8'
					7		
					1	· · · · · · · · · · · · · · · · · · ·	
					1.0	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
					97.4'		
						- (1)	31.1
					C8		_ → †
						509.3 D	1 S 1
						$B_7 \downarrow 67.6'$	4.6'
							ఱᅦ
						U/ 010 0'	
							46' S2
						<u> </u>	4.6' 52

Fixture Type: Lamp Type: Lumens: File # / Date:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273wwc / 18-Feb-2004 **MBELLOMA** Prepared By:



MAINTAINED ILLUMINATION RECTANGLE HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: 18 Average: 51.94 63.85 Maximum: 38.10 Minimum: Avg/Min: 1.363 Max/Min: 1.676 UG (Adj pts) 1.313 CV: 0.149

Number of Luminaires: 462.40 * KW Consumption:

**Average Tilt Factor: 0.844
***Recoverable Light Loss Factors: x 0.800 Total Light Loss Factor(LLF) 0.675

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

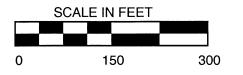
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load

side of ballast box and poles located within 3 feet of design locations.

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 \Rightarrow = Pole Location



EQUIPMENT LISTING

Pole

count

2

S₃

573.6'

			252.5° C ₄		577.1° C1	
			14.	422.6' B1	866.4	
C ₁₂	207.3'	76.1' C3		412.9° A1		7537 C2
	B5	107.2 165-0197.3	/ ₄ B ₃ 320.3'	A3 504.0°	A5 635.7 B	
	A ₁₂ 60.7'	207.6	259.4	412.8° A6	236.0	200
	A8 146.4' 35.0	φ - 102.7 E	<u>B9</u>	425.5' B6		754.0' C5
	¥	¥ 55 ↑	40.0	32.3	= 1	
	B7 67.6°		292.0 C9	<u> </u>	569.3 10.5 Galleria 10.5 G	<u>≅</u> ↓ γ

Fixture Type: Lamp Type: Lumens:

Prepared By:

TLC MZ/TLC MZ 1500W MZ/1500W MZ 155000

File # / Date:

105273wwc / 18-Feb-2004 **MBELLOMA**



INITIAL ILLUMINATION RECTANGLE HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: Average: 37.98 Maximum: 56.43 23.29 Minimum: 1.631 Avg/Min: Max/Min: 2.423 1.900 0.240 UG (Adj pts)

15 Number of Luminaires: 462.40 KW Consumption:

**Average Tilt Factor:

0.952 ***Recoverable Light Loss Factors: x 1.000 Total Light Loss Factor(LLF) 0.952

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

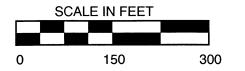
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 \Rightarrow = Pole Location



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

60'

80'

80'

80'

80'

80'

70'

70'

50'

50'

count

2

3

5

6

3

4

location

A1

А3

Α5

A6

A8

A9 A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

Mounting Pole

60'

60'

60'

80'

80'

80'

80' 0'

80'

70'

70'

70'

60' 0'

60' 0'

60' 0'

Pole Fixt. Kilow size Elev. /unit /unit

8 12.8

4 6.4

8 12.8

4 6.4 8 12.8

4 6.4

8 12.8

4 6.4

21 | 33.6

11 17.6

8 12.8

11 17.6 0' 8 12.8

219.6

C₈

394.1

B8 Φ

69.9

67.6

C10

106.7'

20 32

10 16

20 32

0'

0'

0'

0'

0'

0'

0'

0'

0'

0'

0'

50' 0' 4 6.4

50' 0' 2 3.2

4	0	12.0		
	4	6.4		
T	8	12.8		
T	4	6.4		
$^{+}$	8	12.8		
$^{+}$	4	6.4	-	
+	8	12.8		
+		6.4		
+	4		_	
4	20	32	-	—→
4	10	16		C_4 C_4 C_1
1	21	33.6		
1	20	32		588.4.
	11	17.6		588.4.
	8	12.8		
	11	17.6		
i	8	12.8		422.6 B1
1	4	6.4		
+	2	3.2		T _
			C ₁₂ 207.3' 76.1' C ₃	755\rightarrow C2
				J J
			390.8	412.9 A ₁
			/ ½	
				
			B ₅ 81.0'	3. B2 2020 1
			107.2 197.2	1 //L D3 3203 A
		_	11 386.1'	
		C1 219.6	11 / 300.1	
		Ā		259,4
		219	A ₁₂ 60.7′	
		၂ တ	$A_{12} = \begin{bmatrix} 60.7 \\ \end{bmatrix}$	412.8° A6
			$\begin{array}{c c} A_{12} & & & \\ \hline & & \\ \hline & & \\ \hline & & \\ \hline \end{array}$	$\phi \stackrel{\wedge \omega}{\longrightarrow} $
		1	54.2	₹
			B8 276.4' A8 146.4' 35.0' A9 162.7'	₹\$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
			102.7	B9 425.5 B6
				, in the second of the second
		_	· · · · · · · · · · · · · · · · · · ·	
		1		ω /
		100	A10 57.9'	
		97.4'	\	292.0 C9 E
			- 1/1	
		C8	1 394.1'	292.0 C9
			B7 _{67.6'}	22.5 24.6 684.6 0 2.0 1
			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	38.5 in 2 14. 5 in 3 °5.1 .4 in 4 20.4 :35.5 in 3.1 in 6 in 5
				187 30 201 204 188
			272.9	20.0 20.5 21.8 25.1 26.8 21.8
				24.7 27.0 30.3 20.7 20.5 30.1 30.1 31.1
			$C7 \downarrow 2122'$	5.5 37.7 (3.6 37.1 32.3 34.0 36.0 36.0 36.0 36.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37
			$\frac{C7}{212.2'}$	
			1 <u>06.7'</u> C10	Ţ C ₂
				$\frac{573.6}{2}$ $\frac{53}{684.6}$ $\frac{684.6}{2}$

Fixture Type: Lamp Type: Lumens:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

File # / Date: 105273wwc / 18-Feb-2004 **MBELLOMA** Prepared By:



MAINTAINED ILLUMINATION RECTANGLE HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: 30.38 Average: 45.15 Maximum: 18.63 Minimum: Avg/Min: 1.631 Max/Min: 2.423 1.900 UG (Adj pts) CV: 0.240

Number of Luminaires: 15 KW Consumption: 462.40

**Average Tilt Factor: 0.952
***Recoverable Light Loss Factors: x 0.800 Total Light Loss Factor(LLF) 0.762

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

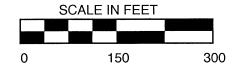
*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 $- \Phi = Pole Location$



EQUIPMENT LISTING

60'

60'

60'

60'

60'

60'

80'

80'

80'

70'

70'

50'

50'

Mounting Pole

Pole

count

1

1

2

3

1

5

6

3

4

location

Α1

A3

A5

A6

Α9

A10

A12

B1-B2

B3-B6

B7

B8

B9

C1-C5

C6

C7-C12

S1-S3

V1-V4

Pole Fixt. Kilow size Elev. /unit /unit

8 12.8

0'

0' 8

0'

0'

0'

0'

0,

80' 0' 21

0' 20

0' 11

0' 8

0' 11

0' 8

0' 4

50' 0' 2

60' 0'

60'

60'

60'

60'

80'

80'

80'

80'

70'

70'

70'

50'

60' 0'

60' 0'

EQUIPMENT LISTING Mounting Pole Fixt. Kilow height size Elev. /unit /unit Pole Pole Mounting Pole count location P1-P4 80' 4 6.4 4 80' 0' 2 S1-S2 70' 0' 9 14.4 70' S3-S4 80' 80' 0' 9 14.4 S5 80' 80' 0' 18 28.8 S6 80' 80' 0' 27 43.2 18 28.8 S7 70' 70' 0' S8-S12 70' 70' 0' 9 14.4

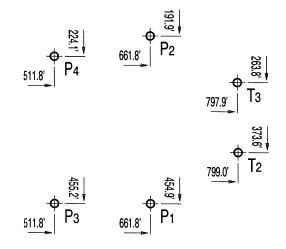
60'

60' 0' 4 6.4

2

T2-T3

S ₁	S8 96.4'	—— > 1
	S ₇ 112.3'	34.3' S9
S ₂ + 346.4'	74.4	_
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		S10 155
	S6 39-9-1000 37.0 34.0 26.5 28 1 35 1000 35.1 4.2 42.9 35.9 30.0 29 3 34 35.1 4.9 37.6 33.1 27.9 27.5 31	.3 51.0 48.7 52. 38.6 .8 38.3 40.0 40.1 3
S4 351.8'	4 .5 44.0 35.8 29.5 30 0 35 10.5 4.0 35.8 29.5 30 0 35 10.5 4.0 35.8 35.0 31 9 40 29.2 35.4 42.8 36.6 27.3 27 7 36	.0 37.7 38.4 40. 3 .6 50.0 46.6 52. 33.4 .3 46.3 41.3 45.2 55
	35 <u>112.6'</u>	175.0' S12



LONG BEACH SPORTS PARK

Fixture Type: Lamp Type: Lumens: TLC MZ 1500W MZ 155000

File # / Date: 105273sodr1 / 18-Feb-2004

Prepared By: MBELLOMA



INITIAL ILLUMINATION
SOCCER
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

 Target Points:
 77

 Average:
 38.23

 Maximum:
 52.86

 Minimum:
 26.55

 Avg/Min:
 1.440

 Max/Min:
 1.991

 UG (Adj pts)
 1.591

 CV:
 0.182

Total Light Loss Factor(LLF)

Number of Luminaires: 36 YKW Consumption: 268.80

0.961

**Average Tilt Factor: 0.961
***Recoverable Light Loss Factors: x 1.000

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

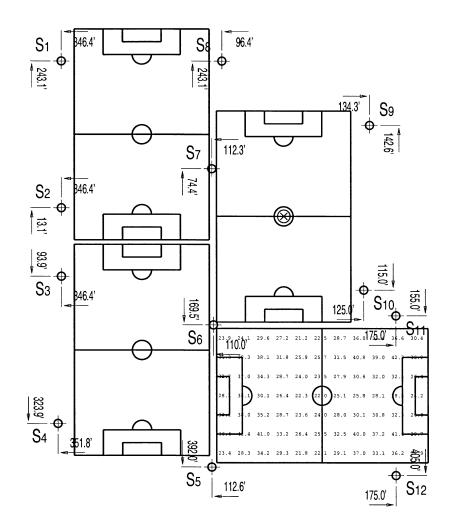
INSTALLATION REQUIREMENTS:

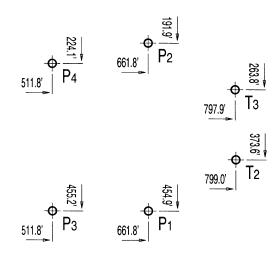
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 $- \Phi = Pole Location$

	EQUIPMENT LISTING									
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilov /uni				
4	P1-P4	80'	80'	0'	4	6.4				
2	S1-S2	70'	70'	0'	9	14.4				
2	S3-S4	80'	80'	0'	9	14.4				
1	S5	80'	80'	0'	18	28.8				
1	S6	80'	80'	0'	27	43.2				
1	S7	70'	70'	0'	18	28.8				
5	S8-S12	70'	70'	0'	9	14.4				
2	T2-T3	60'	60'	0'	4	6.4				





Fixture Type: TL Lamp Type: 15 Lumens: 15

TLC MZ 1500W MZ 155000

105273sodr1 / 18-Feb-2004

File # / Date: 105273sodr1
Prepared By: MBELLOMA



MAINTAINED ILLUMINATION SOCCER HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

 Target Points:
 77

 Average:
 30.59

 Maximum:
 42.29

 Minimum:
 21.24

 Avg/Min:
 1.440

 Max/Min:
 1.991

 UG (Adj pts)
 1.591

 CV:
 0.182

Number of Luminaires: 36
* KW Consumption: 268.80

**Average Tilt Factor: 0.961

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.769

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within

3 feet of design locations.

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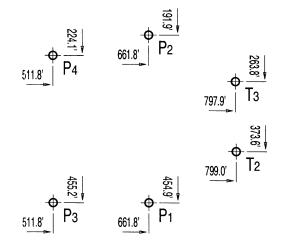
→ = Pole Location



^{*}Refer to amperage draw for electrical sizing.

LONG BEACH SPORTS PARK **EQUIPMENT LISTING** Pole Fixt. Kilow size Elev. /unit /unit Pole Pole Mounting count location 4 P1-P4 80' 80' 0' 4 6.4 2 70' 0' 9 14.4 S1-S2

S ₁ 346.4'	S8 96.4'	
0	33.6	4.3' S9
S ₂ + 346.4'	4. 100 100 100 100 100 100 100 100 100 10	
S3 346.4'	10.9 33.1 39.8 34.4 29.8 30.9 33.1 33.8 34.4 29.8 34.4 29.8 31.1 30.4 31.1 30.4 31.8 31.8 31.8 45.7 49.9 42.2 35.0 35.0 35.0 35.0 35.0 35.0 35.0 35.0	S10 175.0' S11
	S6 110.0'	175.0' S11
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	S5 112.6'	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\



TLC MZ Fixture Type: Lamp Type: 1500W MZ Lumens:

155000 105273sodr1 / 18-Feb-2004

File # / Date: **MBELLOMA** Prepared By:



INITIAL ILLUMINATION SOCCER HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

Target Points: Average: 39.36 Maximum: 57.74 Minimum: 29.10 Avg/Min: 1.352 1.984 Max/Min: UG (Adj pts) 1.716 CV: 0.188

Number of Luminaires: 36 268.80 * KW Consumption:

**Average Tilt Factor: 0.965
***Recoverable Light Loss Factors: x 1.000 Total Light Loss Factor(LLF) 0.965

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

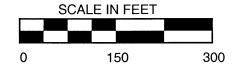
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



S3-S4

S5

S6

S7

S8-S12

T2-T3

1

5

80'

80'

80'

70'

70'

80'

80'

70'

70'

60'

0' 9 14.4

0' 18 28.8

0' 18 28.8

0' 9 14.4

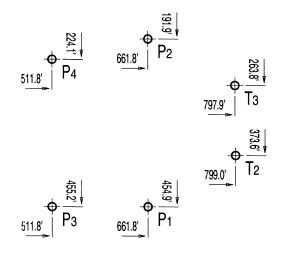
60' 0' 4 6.4

27 43.2

0'

EQUIPMENT LISTING Pole | Mounting | height | size | Elev. | /unit | /

S ₁ 346.4'	S8 96.4'	> -
	S7 112.3 1 2 3	7
S2 346.4'	S7 74.4 936 936 936 937 937 938 938 938 938 938 938 938 938 938 938	2 2 2 3 4 5 1 2 8
S3 346.4'	24.7 26.5 31.9 27.5 23.9 24.7 26.5 31.9 27.5 23.9 24.7 26.8 31.9 27.5 23.9 24.7 26.8 31.0 30.1 26.8	$\begin{array}{c c} \begin{array}{ccccccccccccccccccccccccccccccccccc$
	S6 110.0'	175.0' S11
S4 351.8'		
	S ₅ 112.6'	· · · · · · · · · · · · · · · · · · ·



Fixture Type: Lamp Type: Lumens:

TLC MZ 1500W MZ

155000 105273sodr1 / 18-Feb-2004

File # / Date: 105273sodr1 Prepared By: MBELLOMA



MAINTAINED ILLUMINATION SOCCER HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

 Target Points:
 77

 Average:
 31.49

 Maximum:
 46.19

 Minimum:
 23.28

 Avg/Min:
 1.352

 Max/Min:
 1.984

 UG (Adj pts)
 1.716

 CV:
 0.188

Number of Luminaires: 36
* KW Consumption: 268.80

**Average Tilt Factor: 0.965

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.772

*Refer to amperage draw for electrical sizing.

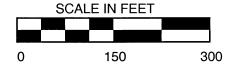
- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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9 14.4

9 14.4

18 28.8

27 43.2

18 28.8

70' 0'

80' 0'

80' 0'

70' 0'

0'

70' 0' 9 14.4 60' 0' 4 6.4

80'

80'

70'

70'

60'

count

4

2

1

5

S1-S2

S3-S4

S5

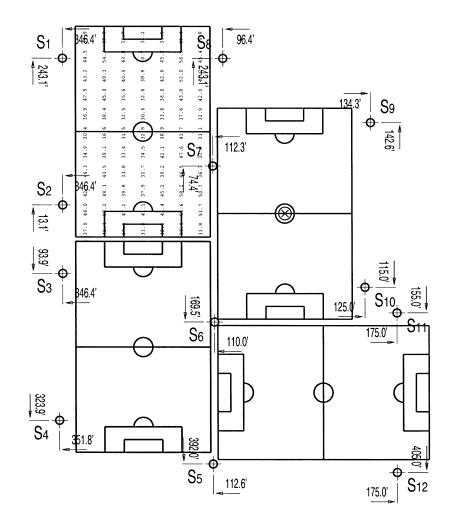
S6

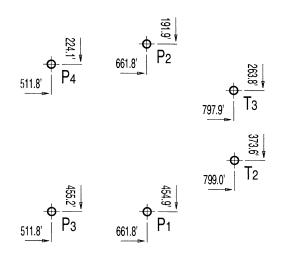
S7

S8-S12

T2-T3

EQUIPMENT LISTING								
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit		
4	P1-P4	80'	80'	0'	4	6.4		
2	S1-S2	70'	70'	0'	9	14.4		
2	S3-S4	80'	80'	0'	9	14.4		
1	S5	80'	80'	0'	18	28.8		
1	S6	80'	80'	0'	27	43.2		
1	S7	70'	70'	0'	18	28.8		
5	S8-S12	70'	70'	0'	9	14.4		
2	T2-T3	60'	60'	0'	4	6.4		





Fixture Type: T Lamp Type: 1 Lumens: 1

TLC MZ 1500W MZ 155000

File # / Date: 155000

105273sodr1 / 18-Feb-2004

Prepared By: MBELLOMA



INITIAL ILLUMINATION
SOCCER
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

 Target Points:
 77

 Average:
 40.58

 Maximum:
 58.24

 Minimum:
 30.42

 Avg/Min:
 1.334

 Max/Min:
 1.915

 UG (Adj pts)
 1.626

 CV:
 0.169

Number of Luminaires: 36
* KW Consumption: 268.80

**Average Tilt Factor: 0.963

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.963

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation per IESNA Lighting Handbook 9th Edition, page 9-17.

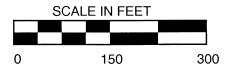
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

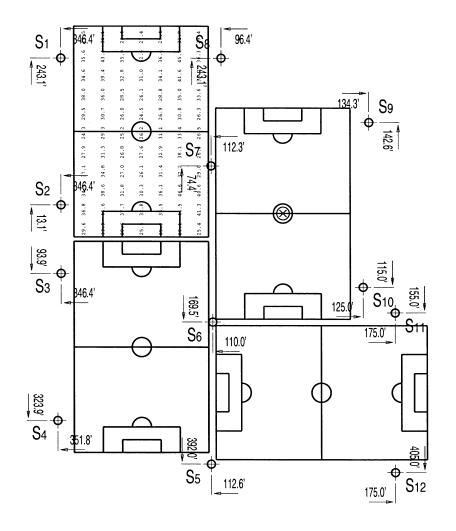
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

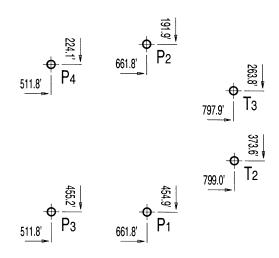
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 \Rightarrow = Pole Location



EQUIPMENT LISTING									
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit			
4	P1-P4	80'	80'	0'	4	6.4			
2	S1-S2	70'	70'	0'	9	14.4			
2	S3-S4	80'	80'	0'	9	14.4			
1	S5	80'	80'	0'	18	28.8			
1	S6	80'	80'	0'	27	43.2			
1	S7	70'	70'	0'	18	28.8			
5	S8-S12	70'	70'	0'	9	14.4			
2	T2-T3	60'	60'	0'	4	6.4			





Fixture Type: T Lamp Type: 1 Lumens: 1

TLC MZ 1500W MZ 155000

105273sodr1 / 18-Feb-2004

File # / Date: 105273sodr1 Prepared By: MBELLOMA



MAINTAINED ILLUMINATION SOCCER HORIZONTAL FOOTCANDLES ON PLANE AT Z= 3

 Target Points:
 77

 Average:
 32.47

 Maximum:
 46.59

 Minimum:
 24.33

 Avg/Min:
 1.334

 Max/Min:
 1.915

 UG (Adj pts)
 1.626

 CV:
 0.169

Number of Luminaires: 36
* KW Consumption: 268.80

**Average Tilt Factor: 0.963

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.770

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation per IESNA Lighting Handbook 9th Edition, page 9-17.

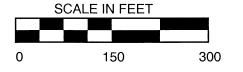
NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS:

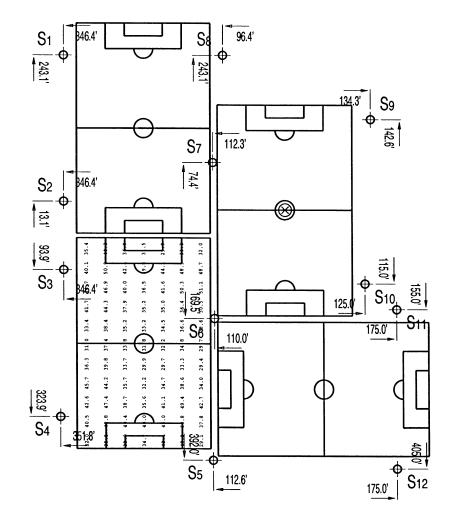
Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

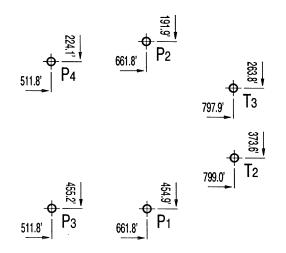
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= Pole Location



EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit
4	P1-P4	80'	80'	0'	4	6.4
2	S1-S2	70'	70'	0'	9	14.4
2	S3-S4	80'	80'	0'	9	14.4
1	S5	80'	80'	0'	18	28.8
1	S6	80'	80'	0'	27	43.2
1	S 7	70'	70'	0'	18	28.8
5	S8-S12	70'	70'	0'	9	14.4
2	T2-T3	60'	60'	0'	4	6.4





Fixture Type: Lamp Type: TLC MZ 1500W MZ 155000 Lumens:

105273sodr1 / 18-Feb-2004 MBELLOMA File # / Date:

Prepared By:



INITIAL ILLUMINATION SOCCER
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

Target Points: 77 38.20 Average: 51.12 28.64 Maximum: Minimum: 1.334 Avg/Min: Max/Min: 1.785 UG (Adj pts) 1.676 0.161

Number of Luminaires: KW Consumption: 268.80

***Average Tilt Factor: 0.963

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.963

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

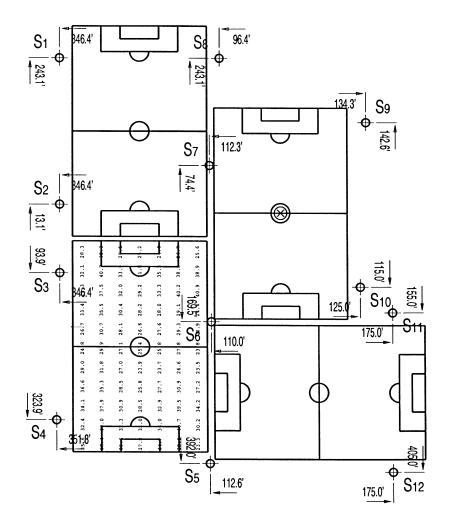
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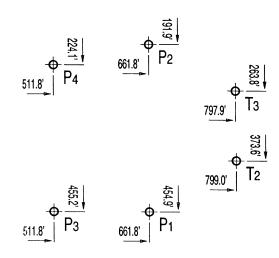
= Pole Location



^{*}Refer to amperage draw for electrical sizing.

	EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit	
4	P1-P4	80'	80'	0'	4	6.4	
2	S1-S2	70'	70'	0'	9	14.4	
2	S3-S4	80'	80'	0'	9	14.4	
1	S5	80'	80'	0'	18	28.8	
1	S6	80'	80'	0'	27	43.2	
1	S7	70'	70'	0'	18	28.8	
5	S8-S12	70'	70'	0'	9	14.4	
2	T2-T3	60'	60'	0'	4	6.4	





TLC MZ Fixture Type: Lamp Type: Lumens:

1500W MZ 155000

105273sodr1 / 18-Feb-2004 MBELLOMA File # / Date:

Prepared By:



MAINTAINED ILLUMINATION SOCCER
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 3

Target Points: 30.56 Average: 40.89 Maximum: 22.91 Minimum: Avg/Min: 1.334 1.785 1.676 Max/Min: UG (Adj pts) ČV: 0.161

Number of Luminaires: * KW Consumption: 268.80

**Average Tilt Factor: 0.963

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.770

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

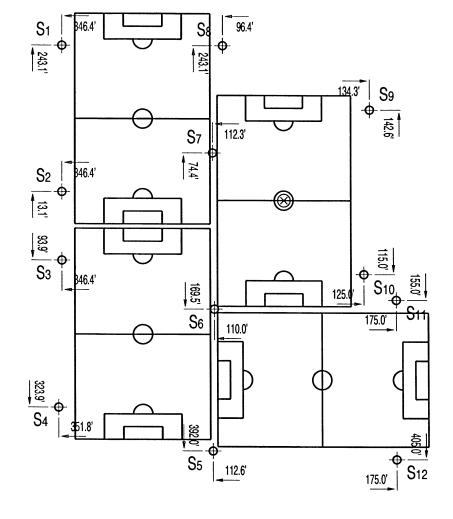
INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

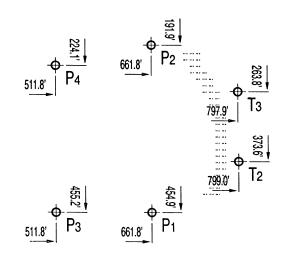
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- → = Pole Location



EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit
4	P1-P4	80'	80'	0'	4	6.4
2	S1-S2	70'	70'	0'	9	14.4
2	S3-S4	80'	80'	0'	9	14.4
1	S5	80'	80'	0'	18	28.8
1	S6	80'	80'	0'	27	43.2
1	S7	70'	70'	0'	18	28.8
5	S8-S12	70'	70'	0'	9	14.4
2	T2-T3	60'	60'	0'	4	6.4





TLC MZ Fixture Type: Lamp Type: 1500W MZ Lumens:

155000

105273sodr1 / 18-Feb-2004 MBELLOMA File # / Date:

Prepared By:



INITIAL ILLUMINATION
Custom HORIZONTAL FOOTCANDLES ON PLANE AT Z= 0
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 0

Target Points: 23.99 32.96 Average: Maximum: 12.42 Minimum: 1.931 Avg/Min: Max/Min: 2.654 1.347 0.203 UG (Adj pts) CV:

Number of Luminaires: * KW Consumption: 268.80

**Average Tilt Factor: 0.956

***Recoverable Light Loss Factors: x 1.000

Total Light Loss Factor(LLF) 0.956

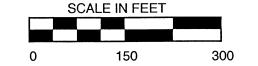
- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

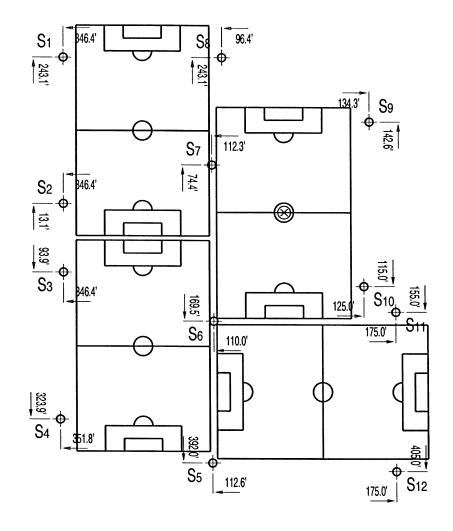
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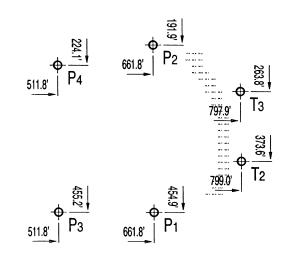
- = Pole Location



^{*}Refer to amperage draw for electrical sizing.

	EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit	
4	P1-P4	80'	80'	0'	4	6.4	
2	S1-S2	70'	70'	0'	9	14.4	
2	S3-S4	80'	80'	0'	9	14.4	
1	S5	80'	80'	0'	18	28.8	
1	S6	80'	80'	0'	27	43.2	
1	S7	70'	70'	0'	18	28.8	
5	S8-S12	70'	70'	0'	9	14.4	
2	T2-T3	60'	60'	0'	4	6.4	





Fixture Type: Lamp Type: Lumens:

TLC MZ 1500W MZ 155000

105273sodr1 / 18-Feb-2004 MBELLOMA File # / Date:

Prepared By:



MAINTAINED ILLUMINATION Custom
HORIZONTAL FOOTCANDLES
ON PLANE AT Z= 0

52 19.19 **Target Points:** Average: 26.37 Maximum: 9.94 Minimum: 1.931 2.654 Avg/Min: Max/Min: UG (Adj pts) 1.347 0.203 CV:

Number of Luminaires: KW Consumption:

**Average Tilt Factor: 0.956

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.764

268.80

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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 \Rightarrow = Pole Location



EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit
4	P1-P4	80'	80'	0'	4	6.4
2	S1-S2	70'	70'	0'	9	14.4
2	S3-S4	80'	80'	0'	9	14.4
1	S5	80'	80'	0'	18	28.8
1	S6	80'	80'	0'	27	43.2
1	S7	70'	70'	0'	18	28.8
5	S8-S12	70'	70'	0'	9	14.4
2	T2-T3	60'	60'	0'	4	6.4

15 - 2.1 3.1 5.0 7.1 8.3 9.3 10.0 10.1 10.3 10.2 9.8 8.9 7.9 6.1 3.9 2.5 1.6 1.0

111111111111111111

-4-8466**374457**450533565**3**435255053256524352250133156154.87.7

Fixture Type: Lamp Type: Lumens:

TLC MZ 1500W MZ

155000 File # / Date: 105273sodr1 / 18-Feb-2004

Prepared By: **MBELLOMA**



INITIAL ILLUMINATION 200 YDS VERTICAL FOOTCANDLES ON PLANE AT X= 330

Target Points: 18 6.51 Average: 10.34 0.98 Maximum: Minimum: 6.671 Avg/Min: Max/Min: 10.593 UG (Adj pts) 1.000 0.505

Number of Luminaires: KW Consumption:

268.80

**Average Tilt Factor: 0.956

***Recoverable Light Loss Factors: x 1.000
Total Light Loss Factor(LLF) 0.956

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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→ = Pole Location



EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit
4	P1-P4	80'	80'	0'	4	6.4
2	S1-S2	70'	70'	0'	9	14.4
2	S3-S4	80'	80'	0'	9	14.4
1	S5	80'	80'	0,	18	28.8
1	S6	80'	80'	0'	27	43.2
1	S 7	70'	70'	0'	18	28.8
5	S8-S12	70'	70'	0'	9	14.4
2	T2-T3	60'	60'	0'	4	6.4

15 - 1.7 2.5 6.0 5.7 6.7 7.5 8.0 8.1 8.3 6.2 7.9 7.1 6.3 6.9 3.1 2.0 1.3 0.6

-4-84664944904904905366384349269049644349290188196184.87.7

Fixture Type: Lamp Type: Lumens:

TLC MZ 1500W MZ

155000 105273sodr1 / 18-Feb-2004 MBELLOMA File # / Date:

Prepared By:



MAINTAINED ILLUMINATION 200 YDS
VERTICAL FOOTCANDLES
ON PLANE AT X= 330

Target Points: 18 Average: 5.21 8.28 Maximum: Minimum: 0.78 Avg/Min: 6.671 Max/Min: 10.593 UG (Adj pts) 1.000 CV: 0.505

Number of Luminaires: * KW Consumption: 268.80

**Average Tilt Factor: 0.956

***Recoverable Light Loss Factors: x 0.800

Total Light Loss Factor(LLF) 0.764

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location



EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit
1	A1	60'	60'	0'	8	12.8
1	A3	60'	60'	0'	4	6.4
1	A 5	60'	60'	0'	8	12.8
1	A6	60'	60'	0'	4	6.4
1	A8	60'	60'	0'	8	12.8
1	A9	60'	60'	0'	4	6.4
1	A10	60'	60'	0'	8	12.8
1	A12	60'	60'	0'	4	6.4
2	B1-B2	80'	80'	0'	20	32
3	B3-B6	80'	80'	0'	10	16
1	B7	80'	80'	0'	21	33.6
1	B8	80'	80'	0'	20	32
1	B9	80'	80'	0'	11	17.6
5	C1-C5	70'	70'	0'	8	12.8
1	C6	70'	70'	0'	11	17.6
6	C7-C12	70'	70'	0'	8	12.8
4	P1-P4	80'	80'	0'	4	6.4
2	S1-S2	70'	70'	0,	9	14.4
1	S3	50'	50'	0'	4	6.4
1	S4	80'	80'	0'	9	14.4
1	S5	80'	80'	0'	18	28.8
1	S6	80'	80'	0'	27	43.2
1	S 7	70'	70'	0'	18	28.8
5	S8-S12	70'	70'	0'	9	14.4
2	T2-T3	60'	60'	0'	4	6.4
4	V1-V4	50'	50'	0'	2	3.2
_						1

2

XXX-XXX

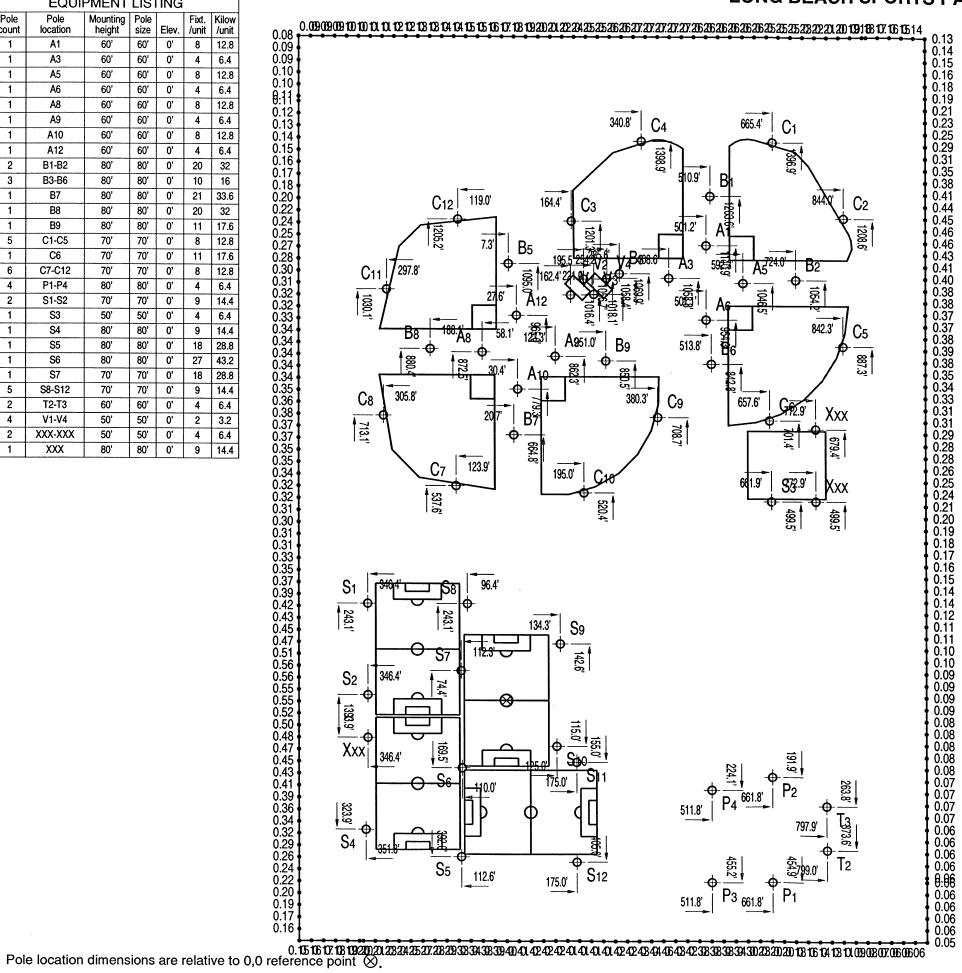
XXX

50'

80'

50' 0' 4 6.4

80' 0' 9 14.4



LONG BEACH SPORTS PARK

TLC MZ/TLC MZ 1500W MZ/1500W MZ Fixture Type: Lamp Type: 155000 Lumens: 105273allc / 18-Feb-2004 File # / Date: **MBELLOMA** Prepared By:

GUARANTEED PERFORMANCE

INITIAL SPILL LIGHT MAXIMUM FOOTCANDLES

258 **Target Points:** 0.25 Average: 0.56 Maximum: Minimum: 0.05 Avg/Min: 4.653 Max/Min: 10.529

Number of Luminaires: 731.20 'KW Consumption:

**Average Tilt Factor: 0.964

***Recoverable Light Loss Factors: x 1.000 Total Light Loss Factor(LLF) 0.964

*Refer to amperage draw for electrical sizing.

** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.

*** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

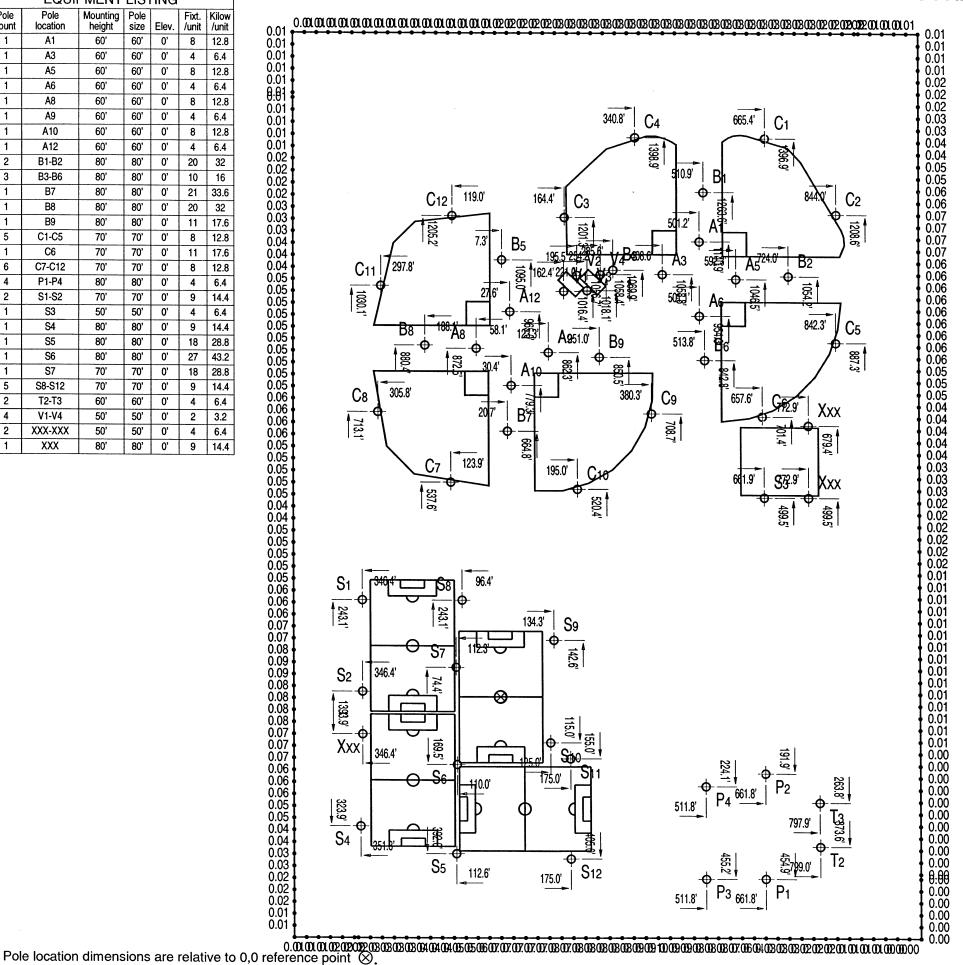
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 $-\Phi$ = Pole Location



	EQUIPMENT LISTING						
Pole count	Pole location	Mounting height	Pole size	Elev.	Fixt. /unit	Kilow /unit	
1	A1	60'	60'	0'	8	12.8	
1	A3	60'	60'	0'	4	6.4	
1	A 5	60'	60'	0'	8	12.8	
1	A6	60'	60'	0'	4	6.4	
1	A8	60'	60'	0'	8	12.8	
1	A9	60'	60'	0'	4	6.4	
1	A10	60'	60'	0'	8	12.8	
1	A12	60'	60'	0'	4	6.4	
2	B1-B2	80'	80'	0'	20	32	
3	B3-B6	80'	80'	0'	10	16	
1	B7	80'	80'	0'	21	33.6	
1	B8	80'	80'	0'	20	32	
1	B9	80'	80'	0'	11	17.6	
5	C1-C5	70'	70'	0'	8	12.8	
1	C6	70'	70'	0'	11	17.6	
6	C7-C12	70'	70'	0'	8	12.8	
4	P1-P4	80'	80'	0'	4	6.4	
2	S1-S2	70'	70'	0'	9	14.4	
1	S3	50'	50'	0,	4	6.4	
1	S4	80'	80'	0'	9	14.4	
1	S5	80'	80'	0'	18	28.8	
1	S6	80'	80'	0'	27	43.2	
1	S7	70'	70'	0'	18	28.8	
5	S8-S12	70'	70'	0'	9	14.4	
2	T2-T3	60'	60'	0'	4	6.4	
4	V1-V4	50'	50'	0'	2	3.2	
2	XXX-XXX	50'	50'	0'	4	6.4	

80' 80' 0' 9 14.4



LONG BEACH SPORTS PARK

Fixture Type: Lamp Type: Lumens: File # / Date:

TLC MZ/TLC MZ 1500W MZ/1500W MZ

155000

105273allc / 18-Feb-2004

MBELLOMA Prepared By:



INITIAL SPILL LIGHT HORIZONTAL FOOTCANDLES

Target Points: 0.04 Average: 0.10 Maximum: Minimum: 0.00 11.526 Avg/Min: Max/Min: 32.658

Total Light Loss Factor(LLF)

Number of Luminaires: 731.20 KW Consumption:

Average Tilt Factor: 0.964 *Recoverable Light Loss Factors: x 1.000

0.964

*Refer to amperage draw for electrical sizing.

- ** Additional non-recoverable Light Loss Factors are design constants equal to 1.0 at maintained illumination levels.
- *** Includes Luminaire Dirt Depreciation and Lamp Lumen Depreciation - per IESNA Lighting Handbook 9th Edition, page 9-17.

NOTE: Light level averages and uniformities are guaranteed by MUSCO. However, individual location measurements may vary from computer predictions.

INSTALLATION REQUIREMENTS: Results assume +-3% nominal voltage at load side of ballast box and poles located within 3 feet of design locations.

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= Pole Location

